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# **WATER SUPPLY OUTLOOK FOR WASHINGTON**



**U. S. DEPARTMENT of AGRICULTURE ★ SOIL CONSERVATION SERVICE**

Collaborating with

**DEPARTMENT OF ECOLOGY STATE OF WASHINGTON**

Data included in this report were obtained by the agencies named above in cooperation with Federal, State and private organizations listed inside the back cover of this report.

AS OF  
**MAY 1, 1977**



## TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1900 snow courses in Western United States and in the Columbia Basin in British Columbia. Networks of automatic snow water equivalent and related data sensing devices, along with radio telemetry are expanding and will provide a continuous record of snow water and other parameters at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

COVER PHOTO: SNOW COURSE MEASUREMENTS BY A SURVEY TEAM IN UTAH'S WASATCH RANGE.  
ORC-254-10

### PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, West Technical Service Center, Room 510, 511 N.W. Broadway, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	Room 129, 2221 East Northern Lights Blvd., Anchorage, Alaska 99504
Arizona	Room 3008, 6029 Federal Building, Phoenix, Arizona 85025
Colorado (N. Mex.)	P. O. Box 17107, Denver, Colorado 80217
Idaho	Room 345, 304 N. 8th. St., Boise, Idaho 83702
Montana	P. O. Box 98, Bazeman, Montana 59715
Nevada	P. O. Box 4850, Reno Nevada 89505
Oregon	1220 S.W. Third Ave., Portland, Oregon 97204
Utah	4012 Federal Bldg., 125 South State St., Salt Lake City, Utah 84138
Washington	360 U.S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 2440, Casper, Wyoming 82602

### PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P. O. Box 388, Sacramento, California 95802 --- and for British Columbia by the Department of Lands, Forests and Water Resources, Water Resources Service, Parliament Building, Victoria, British Columbia



# **WATER SUPPLY OUTLOOK FOR WASHINGTON**

and  
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

*Issued by*

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ADMINISTRATOR  
SOIL CONSERVATION SERVICE  
WASHINGTON, D C

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SPOKANE, WASHINGTON

*In Cooperation with*

**WILBUR G. HALLAUER**

DIRECTOR  
DEPARTMENT OF ECOLOGY  
STATE OF WASHINGTON  
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*Report prepared by*

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SPOKANE, WASHINGTON 99201



# **WATER SUPPLY OUTLOOK**

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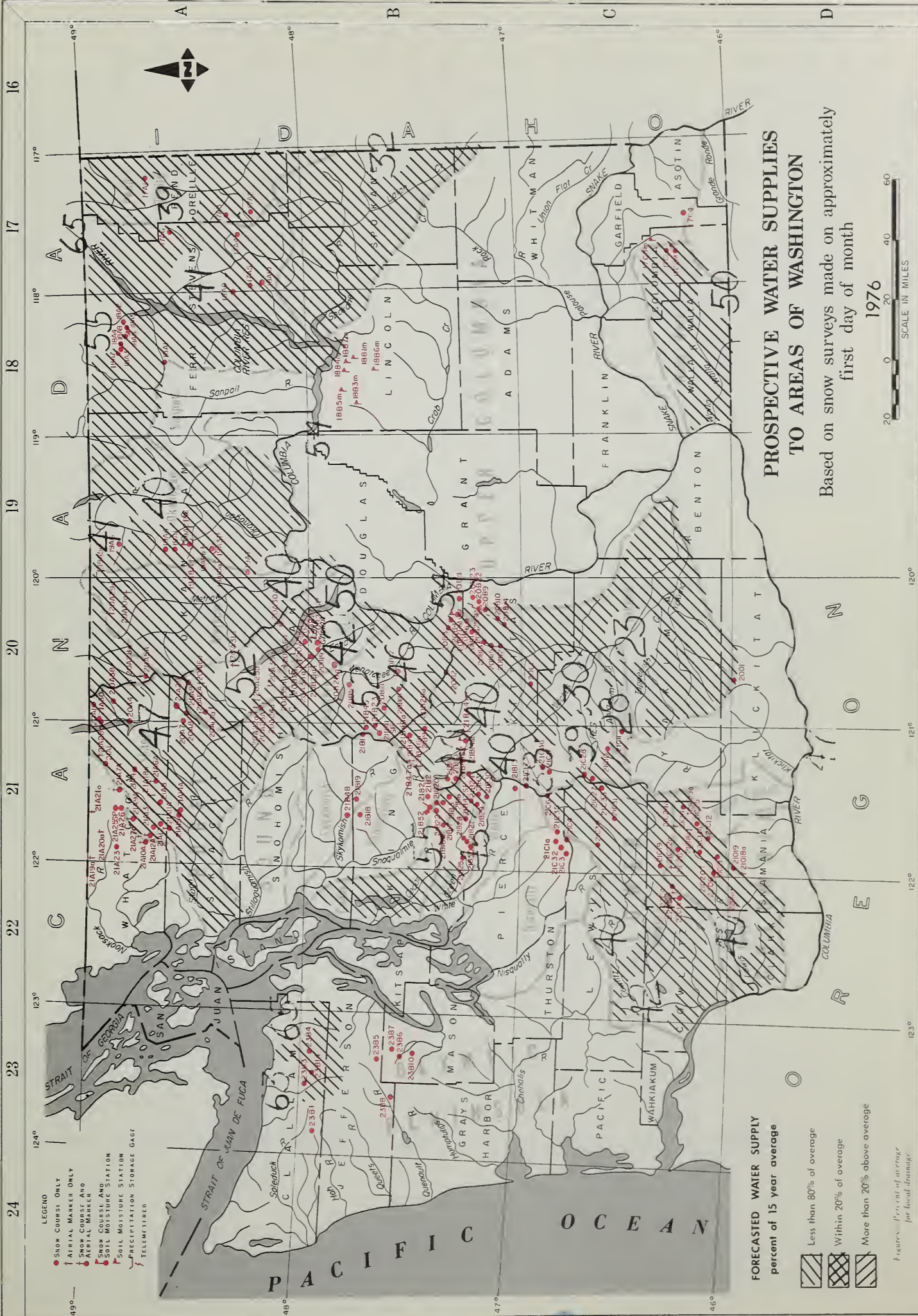
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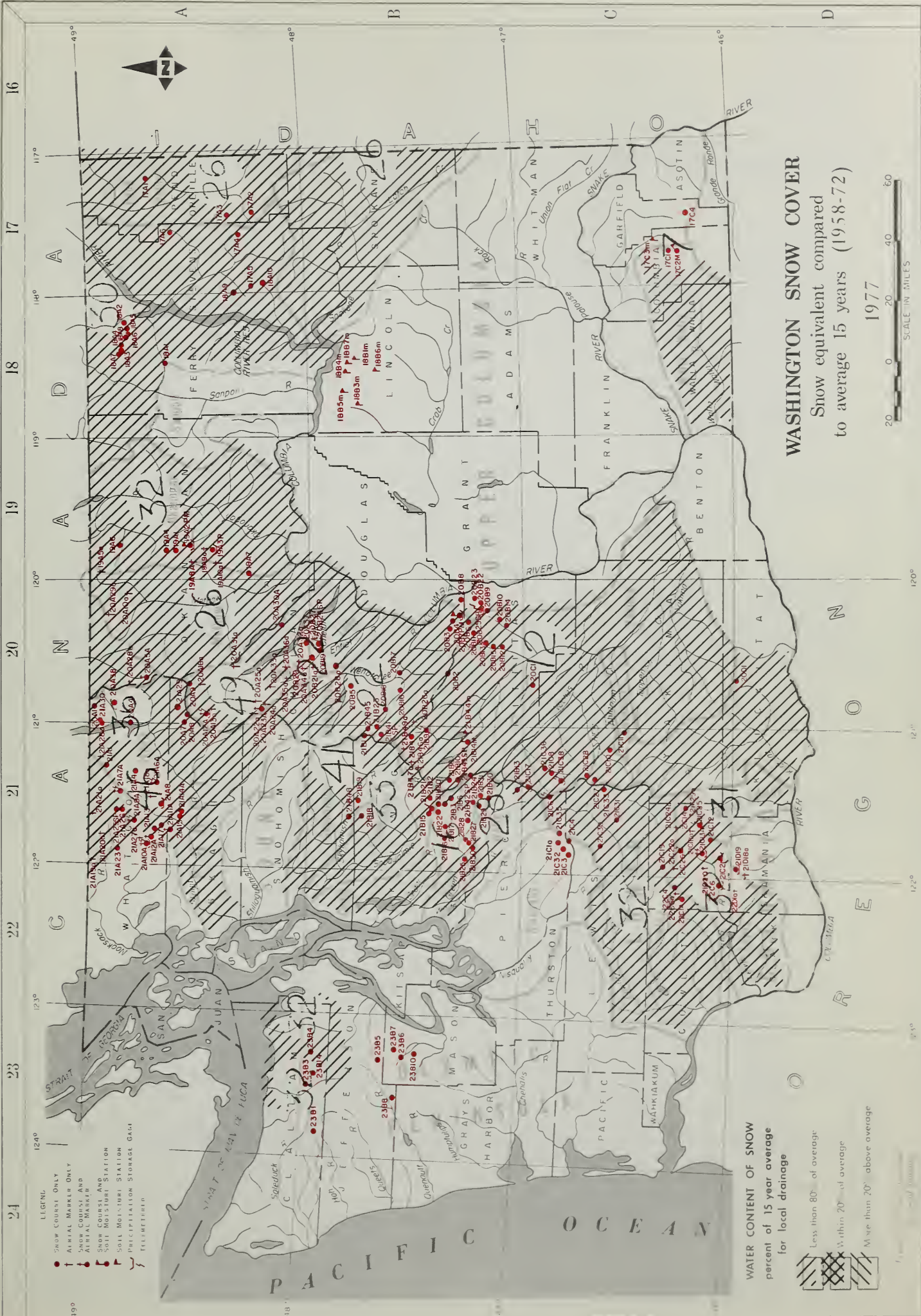




# INDEX to WASHINGTON SNOW COURSES, SOIL MOISTURE STATIONS and PRECIPITATION STORAGE CAGES

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
UPPER COLUMBIA DRAINAGE					
Pend Oreille River					
Boyer Mountain	17A2	7	31N	43E	5250
Bunchgrass Meadow	17A1	24	37N	44E	5000
Winchester Creek	17A3	30	33N	43E	2970
Kettle River					
Boulder Road	18A2	36	39N	36E	1450
Butte Creek	18A3	28	39N	35E	3170
Cabin Creek	18A8	5	38N	36E	4070
Gowat Creek	18A4	26	39N	35E	3595
Snow Caps Creek	18A5	3	38N	36E	3150
Snow Caps Trail	18A6	5	38N	36E	2720
Summit G. S.	18A7	20	39N	35E	4600
Colville River					
Baird	17A6	19	36N	42E	3215
Carlson	18A3	34	32N	38E	2885
Chevelah	17A4	11	32N	41E	4925
Stranger Mountain	17A5	26	31N	38E	4990
Togo	18A10	6	29N	38E	3370
Sanpoil River					
Sherman Creek Pass	18A1	19	36N	35E	5350
Okanogan River					
Clark	19ABa	2	36N	23E	7000
Muckamuck	19ABa	20	36N	24E	6750
Nutton Creek No. 1	19A1	30	37N	24E	5700
Nutton Creek No. 2	19A4	19	37N	24E	6000
Paysayten	20A28a	32	40N	18E	4300
Rusty Creek	19ASp	18	35N	24E	4000
Salmon Meadows	19A2Pn	53	37N	24E	4500
Starvation Mtn.	19A10a	15	35N	23E	6750
Touts Coulee	19A6	30	39N	25E	2845
Methow River					
Billy Goat Pass	20A10a	10	38N	20E	6400
Dollar Watch	20A29a	8	39N	20E	7000
Harts Pass	20ASa	7	37N	18E	6500
Horseshoe Basin	19ASa	15	40N	23E	7000
Loup Loup	19A7	36	34N	23E	4650
Chelan Lake Basin					
Cloudy Pass	20A22a	12	31N	15E	6500
Greenwood Flat	20A25a	3	31N	16E	3540
Little Meadows	20A24a	8	31N	16E	5275
Lyman Lake	20A23a	18	31N	16E	5900
Park Creek Flat	20A13a	19	34N	16E	2220
Park Creek Ridge	20A12a	18	34N	16E	4600
Petersons	20A16a	3	34N	17E	3730
Rainy Pass	20A9	21	35N	17E	4780
Safety Harbor	20A30a	32	31N	20E	6300
War Creek Pass	20A31a	34	33N	18E	6500
Entiat River					
Blue Creek G.S.	20B28a	19	28N	18E	5425
Brief	20B19	34	28N	19E	1600
Entiat Meadows	20A33a	28	31N	17E	4800
Entiat River Trail	20A34a	2	29N	17E	3150
Four Mile Ridge	20B27a	15	28N	19E	3100
Fox Camp	20A36a	17	30N	18E	6510
Pope Ridge	20B20	22	29N	18E	4300
Pope Ridge Snow Pillow	20B24SP	22	29N	18E	4300
Pugh Ridge	20A32a	34	30N	18E	6400
Shady Pass	20A37	20	29N	19E	6200
Snow Brushy	20A35a	21	30N	17E	3850
Tommy Creek	20B21a	10	28N	18E	5300
Wenatchee River					
Berne-Mill Creek	21B23	7	26N	15E	3170
Berne-Mill Creek (New)	21B1SP	13	26N	14E	3240
Blewett Pass No. 2	20B2	35	22N	17E	4370
Chikwauk G. S.	20B16	4	25N	17E	1810
Lake Wenatchee	20B5	33	27N	17E	1970
Leavenworth R. S.	20B17	1	24N	17E	1127
Merritt	20B18	4	26N	16E	2140
Stevens Pass	21B1	14	26N	13E	4070
Stevens Pass Sand Shed	21B45	12	26N	19E	3700
LOWER COLUMBIA DRAINAGE					
Astotin Creek					
Spruce Springs	17C4	9	8N	40E	5700
Mill Creek					
Couse	17C3m	2	9N	40E	3370
Homestead	17C1	11	9N	40E	4030
Marlin Springs (Helmers SM)	17C2m	23	9N	40E	4400
Klickitat River					
Satus Pass	20D1	21	6N	17E	4030
White Salmon River					
Cultus Creek	21C12	35	7N	8E	4000
Lewis River					
Blue Lake	21C22a	19	9N	8E	4800
Bob's Trail	21C21	25	8N	7E	2200
Calamity Ridge	22D1a	8	5N	5E	2500
Council Pass	21C18a	24	9N	9E	4200
Wenatchee River					
Berne-Mill Creek	21B23	7	26N	15E	3170
Berne-Mill Creek (New)	21B1SP	13	26N	14E	3240
Blewett Pass No. 2	20B2	35	22N	17E	4370
Chikwauk G. S.	20B16	4	25N	17E	1810
Lake Wenatchee	20B5	33	27N	17E	1970
Leavenworth R. S.	20B17	1	24N	17E	1127
Merritt	20B18	4	26N	16E	2140
Stevens Pass	21B1	14	26N	13E	4070
Stevens Pass Sand Shed	21B45	12	26N	19E	3700
UPPER COLUMBIA DRAINAGE					
NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Pend Oreille River					
Boyer Mountain	17A2	7	31N	43E	5250
Bunchgrass Meadow	17A1	24	37N	44E	5000
Winchester Creek	17A3	30	33N	43E	2970
Kettle River					
Boulder Road	18A2	36	39N	36E	1450
Butte Creek	18A3	28	39N	35E	3170
Cabin Creek	18A8	5	38N	36E	4070
Gowat Creek	18A4	26	39N	35E	3595
Snow Caps Creek	18A5	3	38N	36E	3150
Snow Caps Trail	18A6	5	38N	36E	2720
Summit G. S.	18A7	20	39N	35E	4600
Colville River					
Baird	17A6	19	36N	42E	3215
Carlson	18A3	34	32N	38E	2885
Chevelah	17A4	11	32N	41E	4925
Stranger Mountain	17A5	26	31N	38E	4990
Togo	18A10	6	29N	38E	3370
Sanpoil River					
Sherman Creek Pass	18A1	19	36N	35E	5350
Okanogan River					
Clark	19ABa	2	36N	23E	7000
Muckamuck	19ABa	20	36N	24E	6750
Nutton Creek No. 1	19A1	30	37N	24E	5700
Nutton Creek No. 2	19A4	19	37N	24E	6000
Paysayten	20A28a	32	40N	18E	4300
Rusty Creek	19ASp	18	35N	24E	4000
Salmon Meadows	19A2Pn	53	37N	24E	4500
Starvation Mtn.	19A10a	15	35N	23E	6750
Touts Coulee	19A6	30	39N	25E	2845
Methow River					
Billy Goat Pass	20A10a	10	38N	20E	6400
Dollar Watch	20A29a	8	39N	20E	7000
Harts Pass	20ASa	7	37N	18E	6500
Horseshoe Basin	19ASa	15	40N	23E	7000
Loup Loup	19A7	36	34N	23E	4650
Chelan Lake Basin					
Cloudy Pass	20A22a	12	31N	15E	6500
Greenwood Flat	20A25a	3	31N	16E	3540
Little Meadows	20A24a	8	31N	16E	5275
Lyman Lake	20A23a	18	31N	16E	5900
Park Creek Flat	20A13a	19	34N	16E	2220
Park Creek Ridge	20A12a	18	34N	16E	4600
Petersons	20A16a	3	34N	17E	3730
Rainy Pass	20A9	21	35N	17E	4780
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Four Mile Ridge	20B27a	15	28N	19E	3100
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Pope Ridge	20B20	22	29N	18E	4300
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Stevens Pass	21B1	14	26N	13E	4070
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UPPER COLUMBIA DRAINAGE					
NAME <th>NUMBER</th> <th>SEC.</th> <th>TWP.</th> <th>RANGE</th> <th>ELEV.</th>	NUMBER	SEC.	TWP.	RANGE	ELEV.
Pend Oreille River					
Boyer Mountain	17A2	7	31N	43E	5250
Bunchgrass Meadow	17A1	24	37N	44E	5000
Winchester Creek	17A3	30	33N	43E	2970
Kettle River					
Boulder Road	18A2	36	39N	36E	1450
Butte Creek	18A3	28	39N	35E	3170
Cabin Creek	18A8	5	38N	36E	4070
Gowat Creek	18A4	26	39N	35E	3595
Snow Caps Creek	18A5	3	38N	36E	3150
Snow Caps Trail	18A6	5	38N	36E	2720
Summit G. S.	18A7	20	39N	35E	4600
Colville River					
Baird	17A6	19	36N	42E	3215
Carlson	18A3	34	32N	38E	2885
Chevelah	17A4	11	32N	41E	4925
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Togo	18A10	6	29N	38E	3370
Sanpoil River					
Sherman Creek Pass	18A1	19	36N	35E	5350
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Fox Camp	20A36a	17	30N	18E	6510
Pope Ridge	20B20	22	29N	18E	4300
Pope Ridge Snow Pillow	20B24SP	22	29N	18E	4300
Pugh Ridge	20A32a	34	30N	18E	6400
Shady Pass	20A37	20	29N	19E	6200
Snow Brushy	20A35a	21	30N	17E	3850
Tommy Creek	20B21a	10	28N	18E	5300
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Colville River					
Baird	17A6	19	36N	42E	3215
Carlson	18A3	34	32N	38E	2885
Chevelah	17A4	11	32N	41E	492

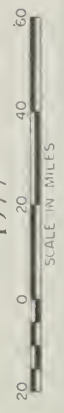




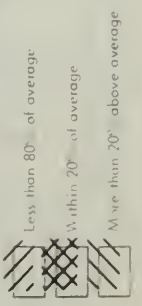
# WASHINGTON SNOW COVER

Snow equivalent compared  
to average 15 years (1958-72)

1977



WATER CONTENT OF SNOW  
percent of 15 year average  
for local drainage





INDEX to WASHINGTON SNOW COURSES, SOIL MOISTURE STATIONS and PRECIPITATION STORAGE GAGES

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.	NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.	NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
UPPER COLUMBIA DRAINAGE																	
Pend Oreille River																	
Boyer Mountain	17A2	7	31N	13E	5250	Wenatchee River (continued)										Lewis River (continued)	
Junegrass Meadow	17A1	24	37N	44E	5000	Trough #2		20B2SSP110		20N 20E		5310		Divide Meadow			
Winchester Creek	17A3	30	33N	43E	2970	Colockum Creek		20B23		1 20N 20E		4300		Grand Meadow		21C25	
Kettle River																	
Boulder Road	18A2	36	39N	36E	1450	Beehive Springs		20B3		12 21N 19E		4400		Lone Pine Shelter		21C26	
Butte Creek	18A3	28	39N	35E	4070	Scout-A-Vista		20B4		18 21N 20E		3400		Marble Mountain		22C5a	
Cabin Creek	18A8	5	38N	36E	3170	Stemilt Creek		20B6		34 21N 20E		4450		New Muddy River		22C6	
Gout Creek	18A4	26	39N	35E	3595	Jump-Off		20B7		30 21N 20E		5000		Oldman Pass		22C7	
Snow Caps Creek	18A5	5	38N	36E	2150	Stemilt Slide		20B7PM		30 21N 20E		4400		Plains of Abraham		22C8	
Snow Caps Trail	18A6	5	38N	36E	2720	Upper Wheeler		20B7PM		30 21N 20E		4400		Smith Creek Road		22C9	
Summit G. S.	18A7	20	39N	35E	4600	Creston-Kunz		18B1m		32 27N 34E		2440		Spencer Meadow		21C20a	
Colville River																	
Baird	17A6	19	36N	42E	3215	Jack Woods		18B3m		28 27N 31E		2750		Table Mountain		21C24a	
Carlson	18A9	34	32N	38E	2885	Krause		18B4m		21 27N 32E		2378		Timbered Peak		21C24a	
Chevelah	17A4	11	31N	41E	4925	Sheffels		18B5m		17 27N 32E		2378		Cayuse Pass		21C19	
Stranger Mountain	17A5	26	31N	38E	4990	Sherman		18B7m		24 27N 33E		2440		Packwood Lake		21C31	
Togo	18A10	6	29N	38E	3370	Wheatridge		18B6m		24 25N 32E		2290		Pigtail Peak		21C33	
Sonpoil River																	
Sherman Creek Pass	18A1	19	36N	35E	5350	Ahtanum R. S.		21C11		24 12N 14E		3100		Potato Hill		21C14	
Okanogan River																	
Clark	19A8a	2	36N	23E	7000	Big Boulder Creek		21B9		35 23N 14E		3200		Willame Creek		21C30	
Muckamuck	19A9a	20	36N	24E	6750	Bumping Lake		21C6		13 16N 12E		3450		Ghost Forest		21C4	
Mutton Creek No. 1	19A1	30	37N	24E	5700	Bumping Ridge New		21C36		19 15N 12E		4600		Longmire		21C35	
Mutton Creek No. 2	19A4	19	37N	24E	6000	Colockum Pass		20B9		25 20N 20E		5370		Paradise Park (New)		21C1	
Paysatzen	20A28a	32	40N	18E	4300	Cooke Creek		20B10		17 19N 20E		4123		Stem Glade		21C1	
Rusty Creek	19A3P	18	35N	24E	4000	Omery Flat		21B44m		15 20N 14E		2200		Corral Pass		21B13	
Salmon Meadows	19A2PM	53	37N	24E	4500	Fish Lake		21B4		28 24N 14E		3371		Green River		21B24	
Starvation Mtn.	19A10a	15	35N	23E	6750	Green Lake		21C10		3 12N 13E		6000		21B25		27 21N 9E	
Touts Coulee	19A6	30	39N	25E	2845	Grouse Camp		20B11		29 21N 19E		5385		White River		21B13	
Methow River																	
Billy Goat Pass	20A10a	10	38N	20E	6400	High Creek		20B12		34 20N 19E		2930		Airstrip		21B24	
Dollar Watch	20A29a	8	39N	20E	7000	Joe Lake		21B46a		22 23N 12E		4624		Charley Creek		21B25	
Harts Pass	20A5A	7	37N	18E	6500	Lake Cle Elum		21C17		6 16N 11E		5400		21B42SP		21 21N 9E	
Horseshoe Basin	19A5a	15	40N	23E	7000	Lemah Creek		20C1		24 17N 16E		3935		21B27		14 20N BE	
Loup Loup	19A7	36	34N	23E	4650	Manastash		20B13		4 20N 19E		3875		21B29		36 20N 10E	
Chelon Lake Basin																	
Cloudy Pass	20A22a	12	31N	15E	6500	Nanum		20B14		20 19N 20E		3360		Lester Creek		21B29	
Greenwood Flat	20A25a	3	31N	16E	3540	Tunnel Creek		20B14		20 19N 20E		3360		Lynn Lake		21B31	
Little Meadows	20A24a	8	31N	16E	5275	Van Epps Pass		20B15		16 23N 15E		5925		Sawmill Ridge		21B35	
Lyman Lake	20A23a	18	31N	16E	5900	Walters Flat		20B15		22 20N 19E		5360		Snowshoe Butte		21B43SP	
Park Creek Flat	20A13a	19	34N	16E	2220	Walters Lake		21B49a		12 23N 13E		3024		Stampede Pass		21B10	
Park Creek Ridge	20A12a	18	34N	16E	4600	White Pass (East Side)		21C28		2 13N 11E		4500		Twin Camp		21B30	
Petersons	20A16a	3	34N	17E	3730	White Pass (Leach Lake)		21C27		1 13N 11E		4500		City Cabin		21B3	
Rainy Pass	20A9	21	35N	17E	4780	Lower Columbia Drainage		Asootin Creek		17C4		9 BN 40E		Mt. Gardner		21B21	
Safety Harbor	20A30a	52	31N	20E	6300	Spruce Springs		17C4		9 BN 40E		5700		Mt. Gardner Aux.		21B22	
War Creek Pass	20A31a	34	35N	18E	6500	Couse		17C3m		2 9N 40E		3370		Mt. Lindsay		21B16	
Entiat River																	
Blue Creek G.S.	20B28a	19	28N	18E	5425	Homesstead		17C1		11 9N 40E		4030		Mt. Washington		21B15	
Brief	20B19	34	28N	19E	1600	Martin Springs (Helmers SM)		17C2M		23 9N 40E		4400		Rex River		21B17	
Entiat Meadows	20A33a	28	31N	17E	4540	Satus Pass		2001		21 6N 17E		4030		South Fork Cedar		21B6	
Entiat River Trail	20A34a	2	29N	17E	3325	Cultus Creek		21C12		35 7N 8E		4000		Tinkham Creek		21B20	
Four Mile Ridge	20B27a	15	38N	19E	6800	Lewis River		21C22a		19 9N BE		4800		Alpine Meadows		21B4B	
Fox Camp	20A36a	1	30N	18E	6510	Blue Lake		21C22a		19 9N BE		4800		Olatie Meadows		21B4B	
Pope Ridge	20B20	22	29N	18E	3540	Bob's Trail		21C21		25 8N 7E		2200		South Fork Tolt		21B1B	
Pope Ridge Snow Pillow	20B24SP	22	29N	18E	3540	Calamity Ridge		21C21		25 8N 7E		2200		Skykomish River		21B19	
Pugh Ridge	20A32a	34	30N	18E	6725	Council Pass											
Shady Pass	20A37	20	29N	19E	6200	Wenatchee River		21B23		7 26N 15E		3170		Berne-Mill Creek		21B23	
Snow Brushy	20A35a	21	30N	17E	3910												
Tommy Creek	20B21a	10	28N	18E	4900	Blewett Pass No. 2		20B2		35 26N 17E		4270		Chiwaukum G. S.		20B16	
UPPER COLUMBIA DRAINAGE																	
Pend Oreille River																	
Boyer Mountain	17A2	7	31N	13E	5250	Wenatchee River (continued)										Lewis River (continued)	
Junegrass Meadow	17A1	24	37N	44E	5000	Trough #2		20B2SSP110		20N 20E		5310		Divide Meadow			
Winchester Creek	17A3	30	33N	43E	2970	Colockum Creek		20B23		1 20N 20E		4300		Grand Meadow		21C25	
Kettle River																	
Boulder Road	18A2	36	39N	36E	1450	Beehive Springs		20B3		12 21N 19E		4400		Lone Pine Shelter		21C26	
Butte Creek	18A3	28	39N	35E	4070	Scout-A-Vista		20B4		18 21N 20E		3400		Marble Mountain		22C5a	
Cabin Creek	18A8	5	38N	36E	3170	Stemilt Creek		20B6		34 21N 20E		4450		New Muddy River		22C6	
Gout Creek	18A4	26	39N	35E	3595	Jump-Off		20B7		30 21N 20E		5000		Oldman Pass		22C7	
Snow Caps Creek	18A5	5	38N	36E	2150	Stemilt Slide		20B7PM		30 21N 20E		4400		Plains of Abraham		22C8	
Snow Caps Trail	18A6	5	38N	36E	2720	Upper Wheeler		20B7PM		30 21N 20E		4400		Smith Creek Road		22C9	
Summit G. S.	18A7	20	39N	35E	4600	Creston-Kunz		18B1m		32 27N 34E		2440		Spencer Meadow		21C20a	
Colville River																	
Baird	17A6	19	36N	42E	3215	Jack Woods		18B3m		28 27N 31E		2750		Table Mountain		21C24a	
Carlson	18A9	34	32N	38E	2885	Krause		18B4m		21 27N 32E		2378		Timbered Peak		21C24a	
Chevelah	17A4	11	31N	41E	4925	Sheffels		18B5m		17 27N 32E		2378		Cayuse Pass		21C19	
Stranger Mountain	17A5	26	31N	38E	4990	Sherman		18B7m		24 27N 33E		2440		Packwood Lake		21C31	
Togo	18A10	6	29N	38E	3370	Wheatridge		18B6m		24 25N 32E		2290		Pigtail Peak		21C33	
Sonpoil River																	
Sherman Creek Pass	18A1	19	36N	35E	5350	Ahtanum R. S.		21C11		24 12N 14E		3100		Potato Hill		21C14	
Okanogan River																	
Clark	19A8a	2	36N	23E	7000	Big Boulder Creek		21B9		35 23N 14E		3200		Willame Creek		21C30	
Muckamuck	19A9a	20	36N	24E	6750	Bumping Lake		21C6		13 16N 12E		3450		Ghost Forest		21C4	
Mutton Creek No. 1	19A1	30	37N	24E	5700	Bumping Ridge New		21C36		19 15N 12E		4600		Longmire		21C35	
Mutton Creek No. 2	19A4	19	37N	24E	6000	Colockum Pass		20B9		25 20N 20E		5370		Paradise Park (New)		21C1	
Paysatzen	20A28a	32	40N	18E	4300	Cooke Creek		20B10		17 19N 20E		4123		Stem Glade		21C1	
Rusty Creek	19A3P	18	35N	24E	4000	Omery Flat		21B44m		15 20N 14E		2200		Corral Pass		21B13	
Salmon Meadows	19A2PM	53	37N	24E	4500	Fish Lake		21B4		28 24N 14E		3371		Green River		21B24	
Starvation Mtn.	19A10a	15	35N	23E	6750	Green Lake		21C10		3 12N 13E		6000		21B25		27 21N 9E	
Touts Coulee	19A6	30	39N	25E	2845	Grouse Camp		20B11		29 21N 19E		5385		White River		21B13	
Methow River																	
Billy Goat Pass	20A10a	10	38N	20E	6400	High Creek		20B12		34 20N 19E		2930		Airstrip		21B24	
Dollar Watch	20A29a	8	39N	20E	7000	Joe Lake		21B46a		22 23N 12E		4624		Charley Creek		21B25	
Harts Pass	20A5A	7	37N	18E	6500	Lake Cle Elum		21C17		6 16N 11E		5400		21B42SP		21 21N 9E	
Horseshoe Basin	19A5a	15	40N	23E	7000	Lemah Creek		20C1		24 17N 16E		3935		21B27		14 20N BE	
Loup Loup	19A7	36	34N	23E	4650	Manastash		20B13		4 20N 19E		3875		21B29		36 20N 10E	
Chelon Lake Basin																	
Cloudy Pass	20A22a	12	31N	15E	6500	Nanum		20B14		20 19N 20E		3360		Lester Creek		21B29	
Greenwood Flat	20A25a	3	31N	16E	3540	Tunnel Creek		20B14		20 19N 20E		3360		Lynn Lake		21B31	
Little Meadows	20A24a	8	31N	16E	5275	Van Epps Pass		20B15		16 23N 15E		5925		Sawmill Ridge		21B35	
Lyman Lake	20A23a	18	31N	16E	5900	Walters Flat		20B15		22 20N 19E		5360		Snowshoe Butte		21B43SP	
Park Creek Flat	20A13a	19	34N	16E	2220	Walters Lake		21B49a		12 23N 13E		3024		Stampede Pass		21B10	
Park Creek Ridge	20A12a	18	34N	16E	4600	White Pass (East Side)		21C28		2 13N 11E		4500		Twin Camp		21B30	
Petersons	20A16a	3	34N	17E	3730	White Pass (Leach Lake)		21C27		1 13N 11E		4500		City Cabin		21B3	
Rainy Pass	20A9	21	35N	17E	4780	Lower Columbia Drainage											

# WATER SUPPLY OUTLOOK

State of Washington

May 1, 1977

\* \* \* \* \*

\* The water supply has not improved one iota during the month of \*  
\* April. In fact, with the lack of snow and rainfall that has \*  
\* occurred over the state and the tributary areas, the situation \*  
\* has worsened from that which we previously reported. The only \*  
\* winter we have had to date was during the month of March, and the \*  
\* water supply forecasts are now similar to those which we reported \*  
\* as of the first of March. The snow packs have all been melting \*  
\* very rapidly this past month and the snow cover now ranges from a \*  
\* high of 49 percent of normal to a low of 7 percent. Many of the \*  
\* snow courses that normally have measureable amounts of snow as of \*  
\* May 1, are totally bare and only the highest elevation snow \*  
\* courses are reported to have any snow cover at all. Things are \*  
\* not nearly as bad in the northern portion of the Columbia Basin \*  
\* in British Columbia. Some snow packs in this area are near \*  
\* normal, but these only at isolated locations. The situation to \*  
\* the east and south of us is even worse than we have here. As a \*  
\* result of this poor snow cover and extreme lack of precipitation \*  
\* input during the month, water supply forecasts have all been \*  
\* reduced from that which was reported last month - some as much as \*  
\* 15 to 20 percent. The soil mantle is drying out - also due to \*  
\* this lack of input and the early growth of the vegetation on the \*  
\* land. Most irrigation reservoirs are in good shape, ranging from \*  
\* 56 to 101 percent of capacity, but the power reservoirs are all \*  
\* down and are in serious trouble with their refill schedule. \*

\* \* \* \* \*

\* \* \* \* \*

## SNOW COVER

There has been a marked decrease in the amount of snow cover measured as of May 1 as compared to that on April 1. The Upper Columbia Basin tributaries show that the snow pack is now 27 percent of normal. This is 18 percent down from what was measured last month. The Lower Columbia snow courses are now 26 percent of normal - 19 percent down. The Puget-Olympic Peninsula Basins are now at 33 percent of normal, or down 17 percent from last months readings. The state, as a whole, now has a snow cover that is only 29 percent of normal. This is down from the 45 percent reported last month. In the Chelan Lake Basin only one snow course was measured this month and this one snow course, Rainy Pass, showed an increase, percentagewise, of 3 percent. This was the only increase in the state. It also is the highest drainage area, percentagewise, reported this month. The worse condition is in the southeastern portion of the state. Again, only one snow course had measureable amounts of snow and this snow course is reported to have only 7 percent of normal snow cover. The Yakima Basin, which appears to be getting most of the publicity and appears to have the greatest problem was measured by sixteen snow courses. These courses indicate the snow pack to be only 12 percent of average.



## RESERVOIRS

The five Yakima reservoirs are filled to 91 percent of capacity, or 22 percent greater than normal for this time of year. The power reservoirs are not in such good shape. Lake Roosevelt is filled to only 32 percent of capacity but this is 2 percent greater than normal. Lake Chelan is filled to 40 percent of capacity and this is 20 percent above average. West of the Cascades, Ross Reservoir is in serious trouble. It is only 38 percent full as of May 1, and is only 72 percent of average.

## PRECIPITATION

Rainfall during the month of April was less than 50 percent of normal over the state and tributary areas. The Columbia Basin in Canada was reported to have only 50 percent of normal rainfall; the Pend Oreille-Spokane, 21 percent; northeastern Washington, 14 percent; southeastern Washington, 16 percent; the central Washington area had precipitation that was only 28 percent of normal; and the northcentral, 44 percent. West of the Cascades, the north area had rainfall that was 52 percent of average while the southwestern slopes were only 39 percent of normal. April precipitation was slightly below the November through March winter period and considerably below that which occurred in March.

## STREAMFLOW

During the month of April, streamflow was generally pretty good. Two stations in the northwestern portion of the state were reported to have above normal runoff. These are the Skykomish and Skagit Rivers. All other stations had below normal runoff with the main stems being reported at near normal and smaller tributaries at well below normal. All water in the streams is being managed for the greatest benefit of the water users. Uncontrolled runoff is being diverted as much as possible for early irrigation and controlled runoff is being stored for later use, both for irrigation and power. An example of this is in the Yakima Drainage where the measured flow of the Lower Yakima River was only 5 percent of normal but the natural flow, taking into consideration storage and diversions, was 32 percent of average. Forecasts of streamflow have all been decreased from those previously issued. Percentagewise, the forecasts made as of March 1, before our winter snowfall, are essentially the forecasts that we are making today. Numerical forecasts can be found on the following pages.

# STREAMFLOW FORECASTS - MAY 1977

The following summarized runoff forecasts are based principally on mountain snow-cover and on the assumption that precipitation and temperature will be near average from the present time to the end of the forecast period. Appreciable deviations from normal of temperature and/or precipitation will correspondingly modify these forecasts. Streamflow figures for 1976 are preliminary and subject to revision.

Basin, Stream and Station	Forecast Runoff 1977	Seasonal Streamflow in Thousands of Acre-Feet					
		% 15-Yr. Avg.	Fore- cast period	1976	1975	1974	15-Yr Average 58-72
<u>COLUMBIA BASIN</u>							
<u>COLUMBIA RIVER SYSTEM</u>							
Columbia River	28200	65	May-Sept	50657	39289	50569	43490
at Birchbank <u>1/</u>	22800	66	May-July	35698	31132	40598	34632
	13300	54	May-June	22773	20618	28011	24633
Columbia River	33600	54	May-Sept	73149	62331	78187	62110
at Grand Coulee <u>1/</u>	29000	56	May-July	54890	51699	65816	51473
	18500	47	May-June	38731	37207	48544	39153
Columbia River	37000	54	May-Sept	78541	68770	85652	67890
bl. Rock Island Dam <u>1/</u>	30000	53	May-July	59584	57944	72754	56790
	21200	49	May-June	42213	41976	53619	43202
Columbia River	43300	47	May-Sept	106435	98803	119450	91550
at The Dalles, OR <u>1/</u>	35000	46	May-July	83524	84097	103189	76815
	24000	40	May-June	62723	62915	78945	60083
<u>PEND OREILLE RIVER SYSTEM</u>							
Pend Oreille River	5400	39	May-Sept	15035	15807	18438	13740
bl. Box Canyon	5000	40	May-July	13376	14132	16990	12471
	3500	33	May-June	11084	10676	13619	10561
<u>KETTLE RIVER SYSTEM</u>							
Kettle River	890	55	May-Sept		1747	2330	1614
nr. Laurier	820	53	May-July		1665	2251	1534
	720	52	May-June		1479	1975	1381
Colville River	37	41	May-Sept		175	164	91
at Kettle Falls	31	39	May-July		153	147	80
	29	41	May-June		137	130	71

1/ Observed flow corrected for storage in any of the following reservoirs which are above the station: Kootenay Lake, Hungry Horse, Flathead Lake, Pend Oreille Lake, F. D. Roosevelt Lake, Lake Chelan, Coeur d'Alene Lake, Brownlee, Noxon Reservoir and pumpage at F. D. Roosevelt Lake.

Basin, Stream and Station	Forecast Runoff 1977	Seasonal Streamflow in Thousands of Acre-Feet					
		%	Fore-	1976	1975	1974	15-Yr. Average 58-72
		15-Yr. Avg.	cast period				
<u>SPOKANE RIVER SYSTEM**</u>							
Spokane River	650	32	May-Sept	2223	2842	3389	2010
at Post Falls ID <u>2/</u>	595	31	May-July	2077	2699	3271	1926
	545	30	May-June	1892	2457	2998	1800
<u>OKANOGAN RIVER SYSTEM</u>							
Similkameen River	590	41	May-Sept	1884	1398	2094	1425
nr. Nighthawk	555	42	May-July	1660	1303	1970	1333
	485	43	May-June	1274	1057	1588	1131
Okanogan River	645	40	May-Sept	2004	1464	2511	1587
nr. Tonasket	600	41	May-July	1654	1319	2288	1446
	522	43	May-June	1230	1063	1784	1213
<u>METHOW RIVER SYSTEM</u>							
Methow River	380	40	May-Sept		942	1517	946
nr. Pateros	310	35	May-July		862	1407	879
	240	32	May-June		678	1120	748
<u>CHELAN RIVER SYSTEM</u>							
Chelan River	575	50	May-Sept	1369	1289	1610	1139
at Chelan <u>3/</u>	500	50	May-July	1091	1136	1369	999
	375	48	May-June	731	784	963	767
Stehekin River	435	52	May-Sept		885	1153	830
at Stehekin	360	51	May-July		758	926	702
	260	49	May-June		488	648	526
Entiat	93	42	May-Sept		258	364	223
nr. Ardenvoir	84	41	May-July		233	323	204
	71	43	May-June		172	232	165
<u>WENATCHEE RIVER SYSTEM</u>							
Wenatchee River	600	52	May-Sept		1316	1750	1165
at Plain	550	53	May-July		1182	1492	1040
	430	53	May-June		844	1028	809
Wenatchee River	730	46	May-Sept	1960	1805	2333	1583
at Peshastin	670	47	May-July	1621	1623	2008	1426
	530	47	May-June	1087	1164	1409	1121
Stemilt Basin	55	40	May-Sept	144*	134*	141*	138*
nr. Wenatchee							
Icicle Creek	205	55	Apr-Sept				371
nr. Leavenworth	170	50	Apr-July				342
	125	45	Apr-June				279

\*\* Forecasts made by Jack A. Wilson, Soil Conservation Service, Boise, Idaho.

\* Forecast in Thousands of Miners' Inches

2/ Observed flow corrected for storage in Coeur d'Alene Lake and diversions by Spokane Valley Farms Company and Rathdrum Prairie Canals.

3/ Observed flow corrected for storage in Lake Chelan.



Basin, Stream and Station	Forecast Runoff 1977	Seasonal Streamflow in Thousands of Acre-Feet					
		% 15-Yr.	Fore- cast	1976	1975	1974	15-Yr. Average 58-72
		Avg.	period				
<u>YAKIMA RIVER SYSTEM</u>							
Yakima River	46	40	May-Sept	134	156	204	115
nr. Martin <u>4/</u>	38	36	May-July	121	142	187	104
	37	42	May-June	97	115	143	89
Yakima River	320	40	May-Sept		1020	1282	794
at Cle Elum <u>5/</u>	270	38	May-July		920	1154	706
	260	44	May-June		750	886	593
Yakima River	300	23	May-Sept		1947	2644	1328
nr. Parker <u>6/</u>	290	22	May-July		1859	2521	1298
	270	23	May-June		1577	2030	1178
Kachess River	40	40	May-Sept	110	141	179	100
nr. Easton <u>7/</u>	36	39	May-July	98	132	165	93
	32	40	May-June	76	107	128	81
Cle Elum River	200	48	May-Sept	506	506	676	410
nr. Roslyn <u>8/</u>	180	49	May-July	428	459	595	371
	150	49	May-June	311	355	431	306
Bumping River	49	38	May-Sept	162	172	213	129
nr. Nile <u>9/</u>	45	38	May-July	138	155	190	118
	37	39	May-June	96	112	135	96
American River	45	40	May-Sept		141	185	112
nr. Nile	42	41	May-July		129	163	103
	36	42	May-June		96	119	85
Tieton River	85	39	May-Sept	274	277	360	214
at Tieton Dam <u>10/</u>	70	39	May-July	211	232	292	178
	60	43	May-June	146	166	211	139
Naches River	225	30	May-Sept		959	1237	748
nr. Naches <u>11/</u>	190	28	May-July		856	1094	669
	170	30	May-June		666	846	557
Ahtanum Creek	11	28	May-Sept		50	68	39
nr. Tampico <u>12/</u>	9	26	May-July		44	61	35
	8	27	May-June		37	49	30

4/ Observed flow corrected for storage in Lake Keechelus.

5/ Observed flow corrected for storage in Keechelus, Kachess and Cle Elum Lakes and diversion by Kittitas Canal.

6/ Observed flow corrected for storage in Keechelus, Kachess, Cle Elum, Bumping and Rimrock Lakes and diversions by Roza, Union Gap, New Reservation, Old Reservation and Sunnyside Canals.

7/ Observed flow corrected for storage in Lake Kachess.

8/ Observed flow corrected for storage in Lake Cle Elum.

9/ Observed flow corrected for storage in Bumping Lake.

10/ Observed flow corrected for storage in Rimrock Lake.

11/ Observed flow corrected for storage in Bumping and Rimrock Lakes and diversions by Tieton, Selah Valley, Wapatox Canals and City of Yakima.

12/ Observed flow of North and South Forks (Combined).

Basin, Stream and Station	Forecast Runoff 1977	Seasonal Streamflow in Thousands of Acre-Feet					
		15-Yr. Avg.	Fore- cast period	1976	1975	1974	15-Yr. Average 58-72
<u>LOWER COLUMBIA RIVER SYSTEM</u>							
Mill Creek	9	50	May-Sept		30	39	18
nr. Walla Walla	6	42	May-July		25	33	14
	5	42	May-June		21	29	12
Lewis River	370	40	May-Sept	1001	969	1469	932
at Ariel <u>13/</u>	290	38	May-July	829	804	1276	765
	240	37	May-June	680	666	1066	643
Cowlitz River	660	40	May-Sept		1894	2745	1650
Bl. Mayfield Dam	540	39	May-July		1619	2397	1391
	450	40	May-June		1218	1837	1123
Cowlitz River	890	42	May-Sept	2369	2314	3283	2108
at Castle Rock <u>14/</u>	715	41	May-July	1889	1946	2849	1741
	600	43	May-June	1454	1484	2184	1407
<u>OLYMPIC PENINSULA</u>							
<u>DUNGENESS RIVER SYSTEM</u>							
Dungeness River	97	65	May-Sept		139	187	147
nr. Sequim	72	60	May-July		108	145	119
	55	65	May-June		72	93	85
<u>PUGET SOUND</u>							
<u>SKAGIT RIVER SYSTEM</u>							
Skagit River	960	47	May-Aug		2123	2759	2037
at Newhalem <u>15/</u>							
<u>CEDAR RIVER SYSTEM</u>							
Cedar River	50	55	Apr-Sept		101	145	91
at Cedar Falls							

13/ Observed flow corrected for storage in Lake Merwin, Yale and Swift Reservoirs.

14/ Observed flow corrected for storage in Mayfield Reservoir.

15/ Observed flow corrected for storage in Diablo, Ross and Gorge Reservoirs.



Basin, Stream and Station	Forecast Runoff 1977	Seasonal Streamflow in Thousands of Acre-Feet					
		% 15-Yr. Avg.	Fore- cast period	1976	1975	1974	15-Yr. Average 58-72
<u>GREEN RIVER SYSTEM</u>							
Green River Bl. Howard Hanson Dam <u>16/</u>	100	46	May-Sept		293	372	220
<u>ELWHA RIVER SYSTEM</u>							
Elwha River nr. Port Angeles	290 235	63 63	May-Sept May-July		501 391	662 516	465 375

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16/ Observed flow corrected for storage in Howard Hanson Dam.

# COMPARISON OF SNOW COVER WITH THAT OF PREVIOUS YEARS

The following tabulation of Washington stream basins presents the water content of the snow about May 1, 1977 as percent of the same date in 1976 and 1975 and average of record.

Tributary Basin	No. of Courses Average	1977 Snow Water Expressed as percent of		
		1976	1975	1958-72 Avg.
<u>UPPER COLUMBIA BASIN</u>				
Pend Oreille	18	27	19	26
Kettle	18	28	26	30
Spokane	10	26	22	26
Okanogan	38	29	26	32
Methow	7	23	17	26
Chelan	1	36	44	49
Entiat	10	15	18	22
Wenatchee	10	17	14	22
Yakima	16	26	24	12
<u>LOWER COLUMBIA</u>				
Asotin Creek	1	6	5	7
White Salmon	2	28	29	31
Lewis	17	26	27	32
Cowlitz	3	36	35	32
<u>PUGET SOUND</u>				
White	3	33	29	28
Green	2	25	20	16
Snoqualmie	1	28	24	33
Skykomish	2	27	24	41
Skagit	14	27	31	36
Nooksack	1	37	42	-
Baker	13	36	44	46
<u>OLYMPIC PENINSULA</u>				
Elwha	1	25	30	32
Dungeness	1	-	-	32

RESERVOIR STORAGE - 1000 Acre Feet

BASIN OR STREAM	RESERVOIR	USABLE 1/ CAPACITY	1977	Measured May 1		
				1976	1975	Normal*
<u>COLUMBIA</u>						
Spokane	Coeur d'Alene Lake	225.1	179.3	236.7	204.2	253.2
Columbia	Franklin D. Roosevelt Lake	5232.0	1688.2	659.3	312.1	1654.6
Columbia	Banks Lake	714.9	464.3	597.3	550.7	457.7
Okanogan	Conconully Reservoir	13.0	7.4	11.3	11.0	11.2
Okanogan	Salmon Lake	10.5	9.3	9.8	9.5	7.8
Chelan	Lake Chelan	676.1	268.8	367.3	79.0	225.1
<u>YAKIMA</u>						
Yakima	Keechelus Lake	157.8	118.5	104.5	99.5	121.2
Kachess	Kachess Lake	239.0	234.2	218.5	176.5	199.2
Cle Elum	Lake Cle Elum	436.9	441.3	307.3	276.6	310.9
Bumping	Bumping Lake	33.7	26.2	8.0	3.0	16.1
Tieton	Rimrock Lake	198.0	154.6	141.2	134.8	146.9
<u>PUGET SOUND</u>						
Skagit	Ross Reservoir	1404.1	539.5	743.0	385.9	751.2
Skagit	Diablo Reservoir	90.6	86.8	87.1	86.9	85.7
Skagit	Gorge Reservoir	9.8	7.1	8.4	7.9	-

1/ Based on Active Storage

\* 15-year Average 1958-72

SOIL MOISTURE - MAY

Drainage Basin and Station	Number	Elev.	Profile Depth	(Inches):	Soil Moisture Content		
				Total : Capacity :	(Inches) as of	May 1	
					1977	1976	1975
<u>OKANOGAN</u>							
Salmon Meadows	19A2M	4500	48	5.4	3.8	4.3	3.8
Trout Creek	3-M	3600	48	7.3	3.5*	4.9*	-
<u>YAKIMA</u>							
Domery Flat	21B20m	2200	48	6.9	-	-	-
Lake Cle Elum	21B14M	2200	48	12.8	-	-	-
<u>WALLA WALLA</u>							
Couse	17C3m	3650	48	11.1	6.4	-	-
Helmerts	17C2M	4400	48	12.0	10.1	-	-
<u>WENATCHEE</u>							
Upper Wheeler	20B7M	4400	48	12.7	8.0	15.2	12.4

\* April 1 Measurement

FALL SOIL MOISTURE

Drainage Basin and Station	Number	Elev.	Profile Depth	(Inches):	Soil Moisture Content		
				Total : Capacity :	(Inches) as of	Oct. 1	
					1976	1975	1974
<u>OKANOGAN</u>							
Salmon Meadows	19A02M	4500	48	5.4	3.4	3.2	1.8
Trout Creek	3-M	3600	48	7.3	3.4	3.1	3.0
<u>YAKIMA</u>							
Domery Flat	21B20m	2200	48	6.9	-	-	-
Lake Cle Elum	21B14M	2200	48	12.8	-	-	-
<u>WALLA WALLA</u>							
Couse	17C3m	3650	48	11.1	-	7.3	-
Helmerts	17C2M	4400	48	12.0	-	6.5	-
<u>WENATCHEE</u>							
Upper Wheeler	20B7M	4400	48	12.7	-	8.6	5.4

# PRECIPITATION 1/

## Division Average Observations and Departures

Drainage Divisions	FALL		WINTER		SPRING	
	Sept-Oct Observed	1976 <u>2/</u> Departure	Nov. 1976--Mar. 1977 Observed	Departure	April 1977 Observed	Departure
Columbia in Canada	3.10	- 1.92	8.92	- 6.59	0.85	-0.86
Pend Oreille - Spokane	1.54	- 2.50	8.23	- 9.32	0.39	-1.43
Northeastern Washington	0.87	- 1.60	3.80	- 5.60	0.18	-1.08
Southeastern Washington	1.45	- 1.06	4.28	- 6.15	0.24	-1.29
Central Washington	1.24	- 3.51	11.28	-16.25	0.62	-1.57
North Central Washington	0.61	- 0.98	3.26	- 3.28	0.38	-1.47
Northwest Slope Cascades	6.65	- 6.56	35.21	-20.18	3.43	-3.21
Southwest Slope Cascades	4.30	- 4.37	18.34	-23.30	1.78	-2.84
Northeastern Washington		- Lower Spokane, Colville, Sanpoil and Lower Kettle Drainages.				
Southeastern Washington		- Touchet, Tucannon and Palouse Drainages.				
Central Washington		- Yakima, Wenatchee and Chelan Drainages.				
North Central Washington		- Methow and Okanogan Drainages.				
Northwest Slope Cascades		- Puget Sound Drainages.				
Southwest Slope Cascades		- Lower Columbia Drainages.				

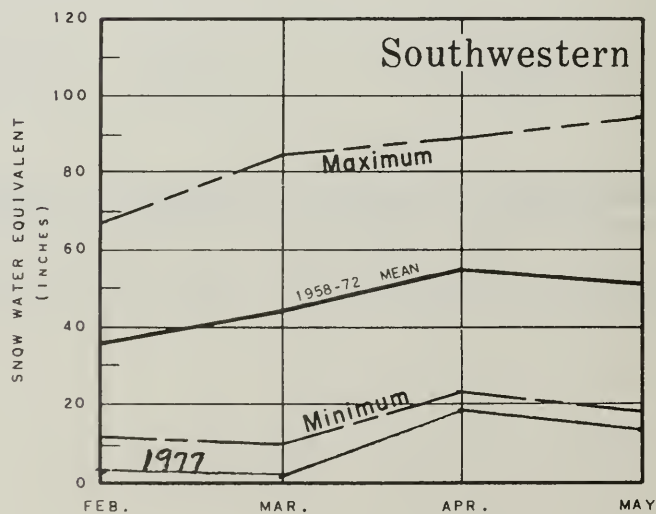
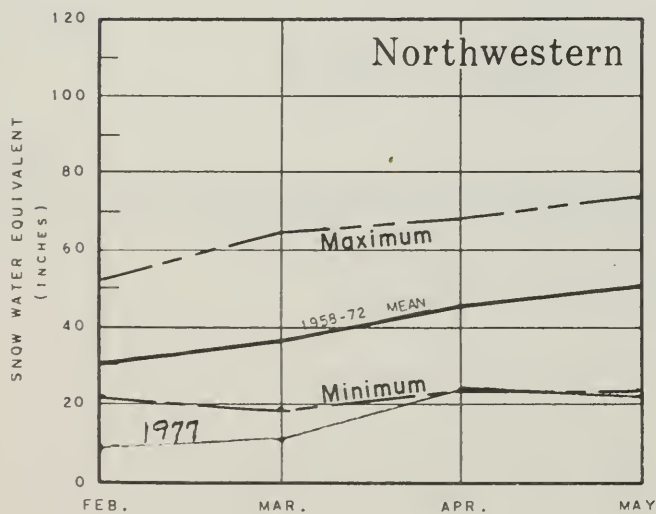
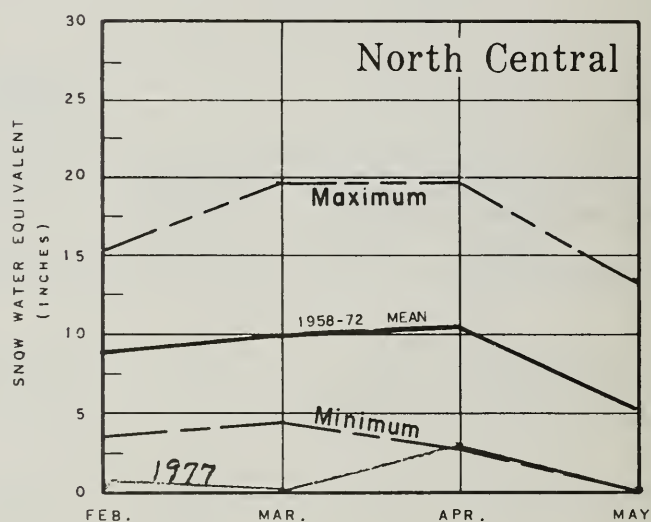
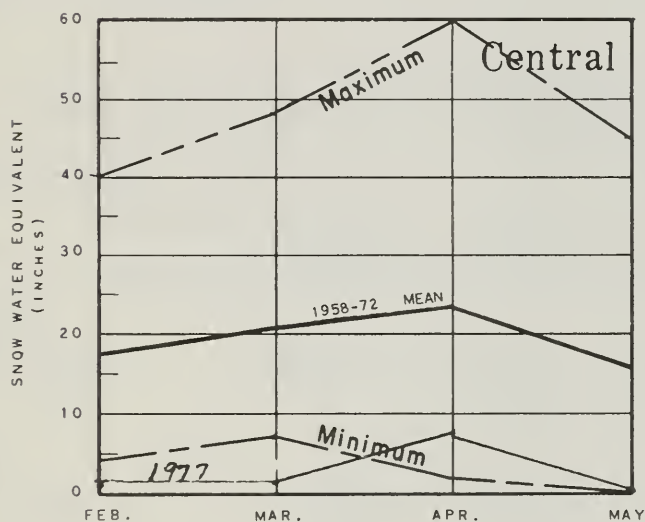
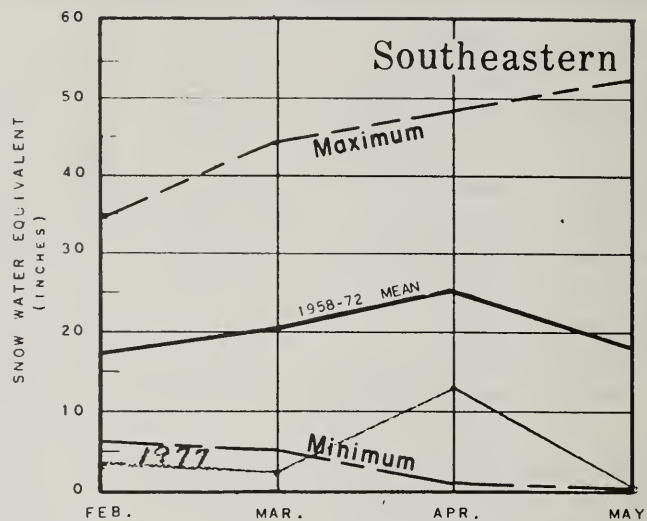
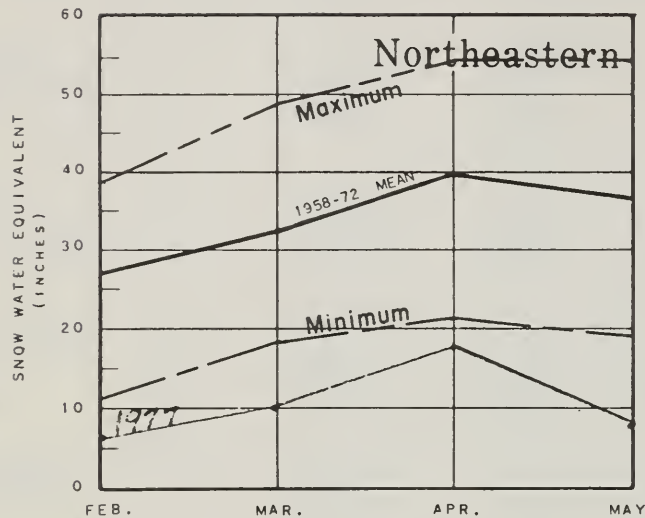
1/ - Preliminary analysis by National Weather Service from data furnished by Meteorological Services of Canada and the National Weather Service.

2/ - Departure from 15-year (1958-72) drainage division average.



# WASHINGTON SNOW COVER

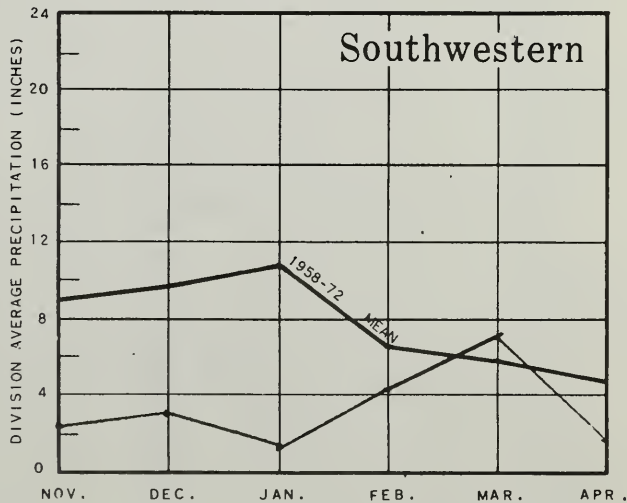
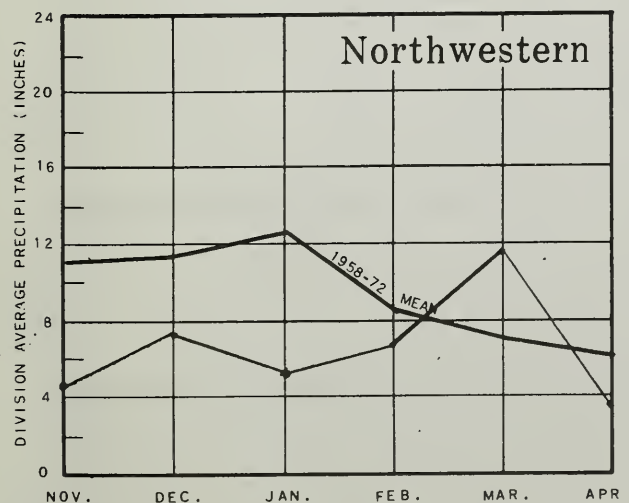
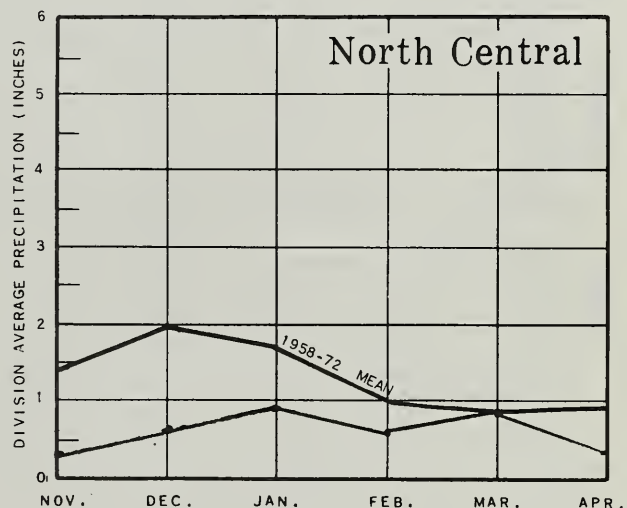
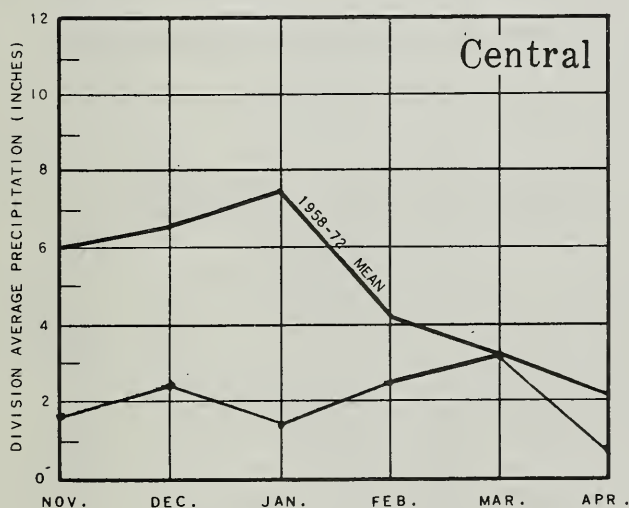
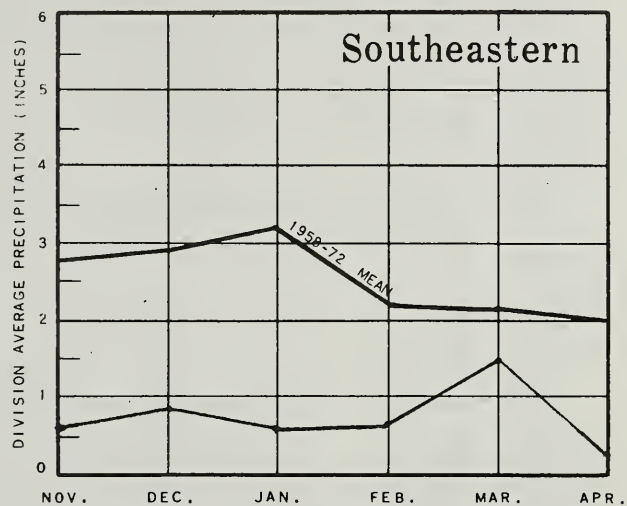
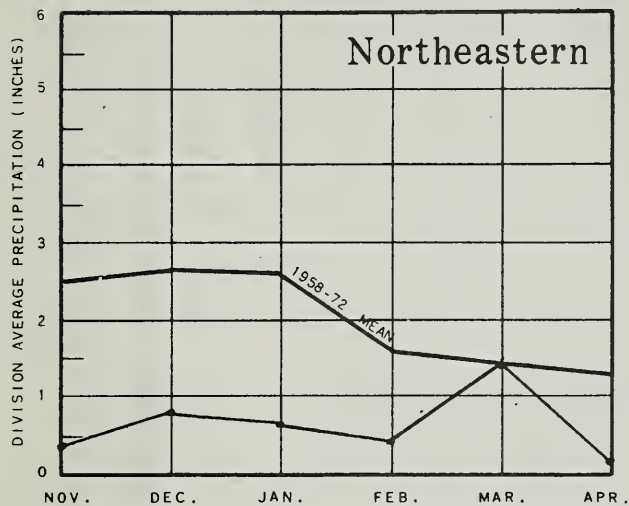
## DRAINAGE AREAS



# WASHINGTON VALLEY PRECIPITATION

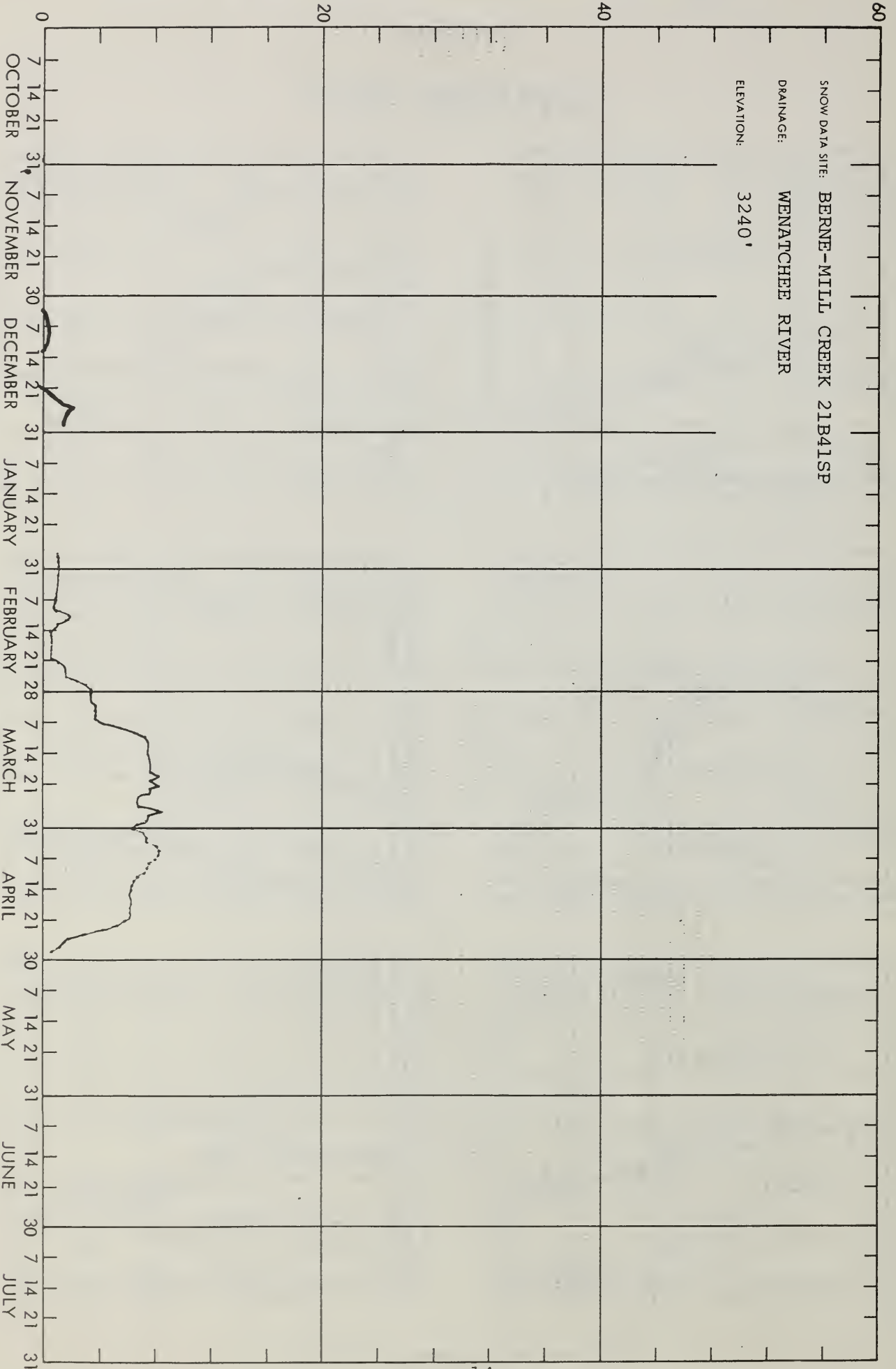
1976-1977

## DRAINAGE AREAS



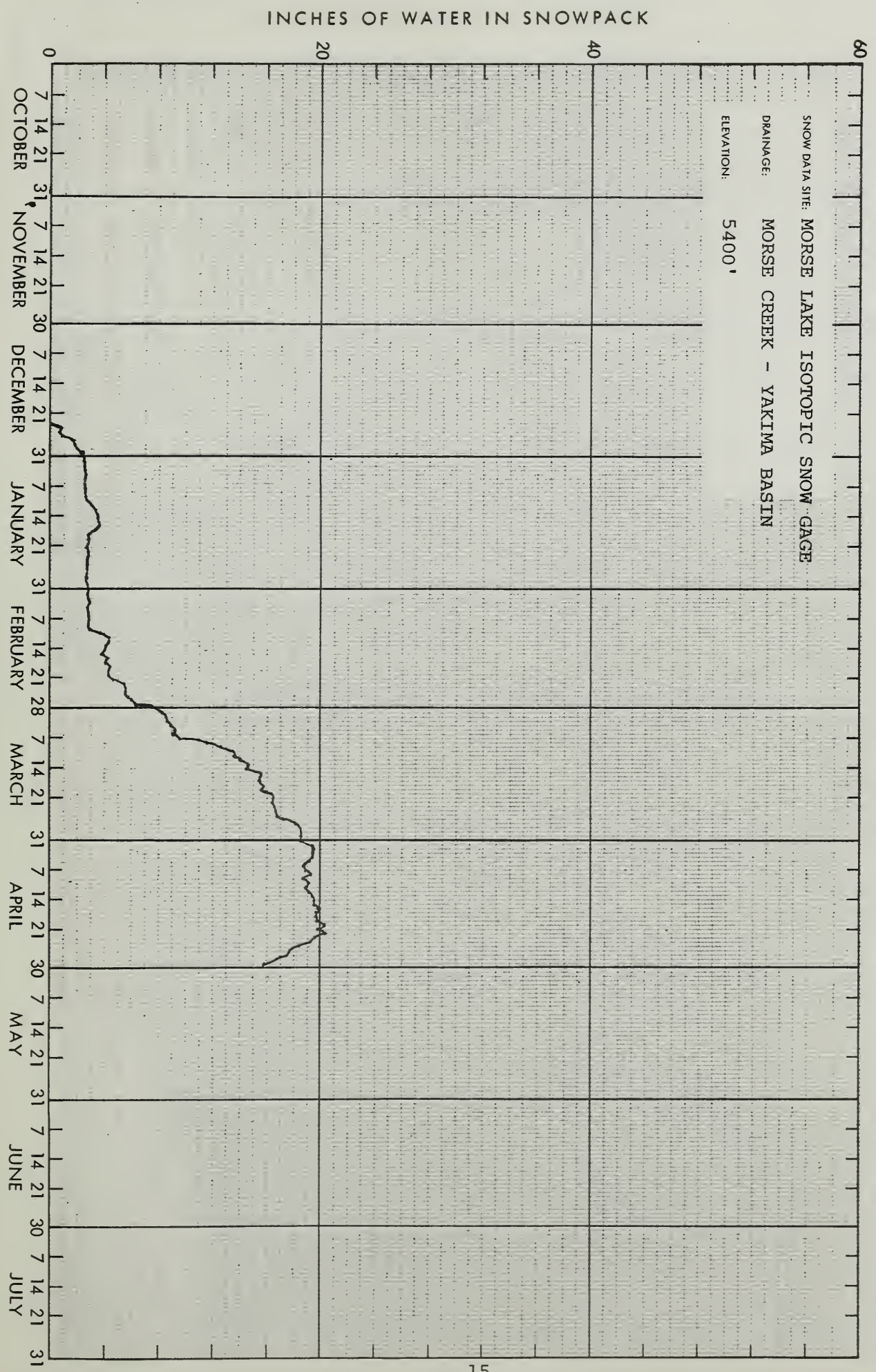
Preliminary Analysis by National Weather Service

INCHES OF WATER IN SNOWPACK





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# INCHES OF WATER IN SNOWPACK

60

SNOW DATA SITE: PARK CREEK RIDGE SNOW PILLOW

DRAINAGE: CHELAN LAKE BASIN

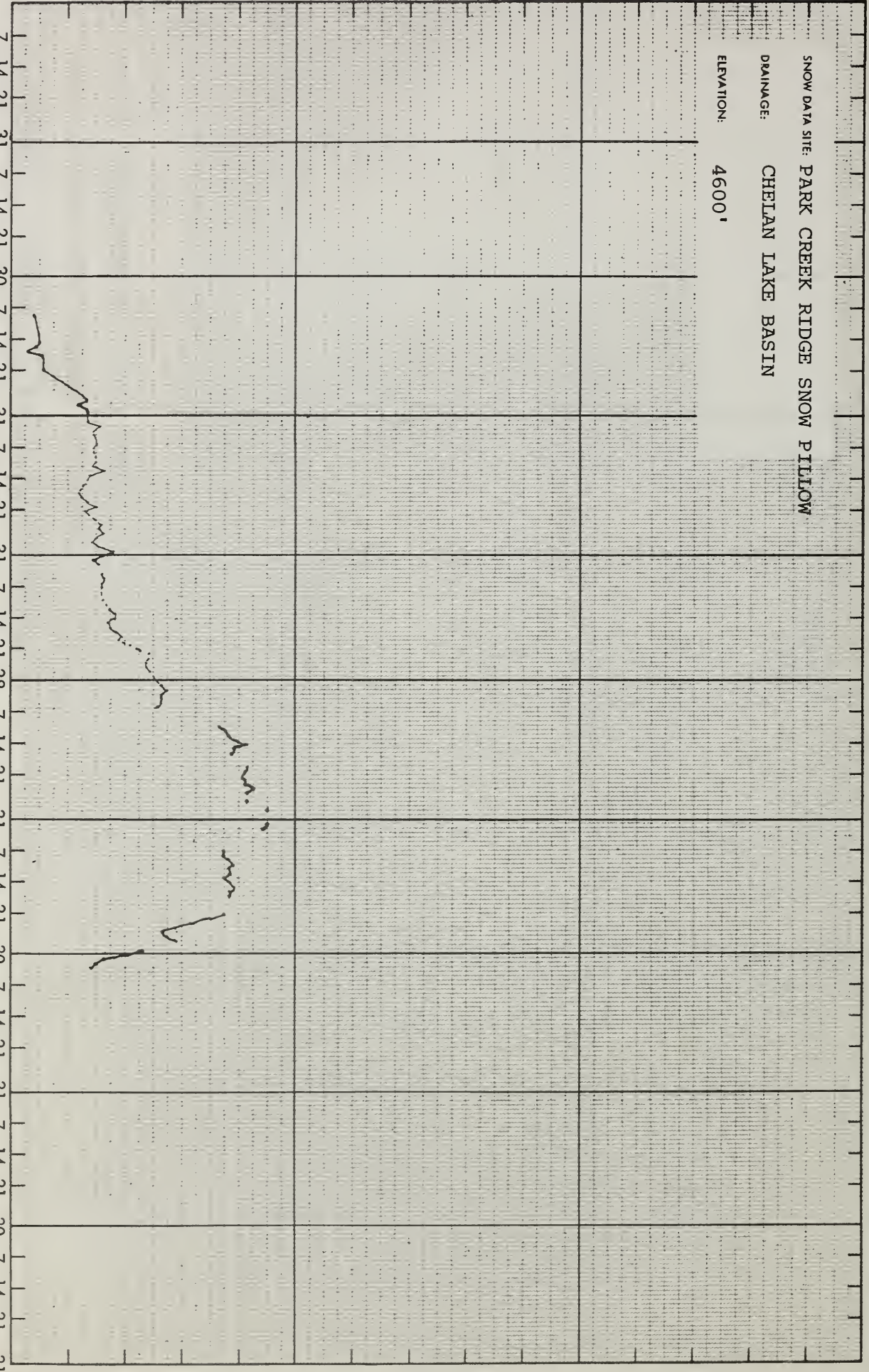
ELEVATION: 4600'

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20

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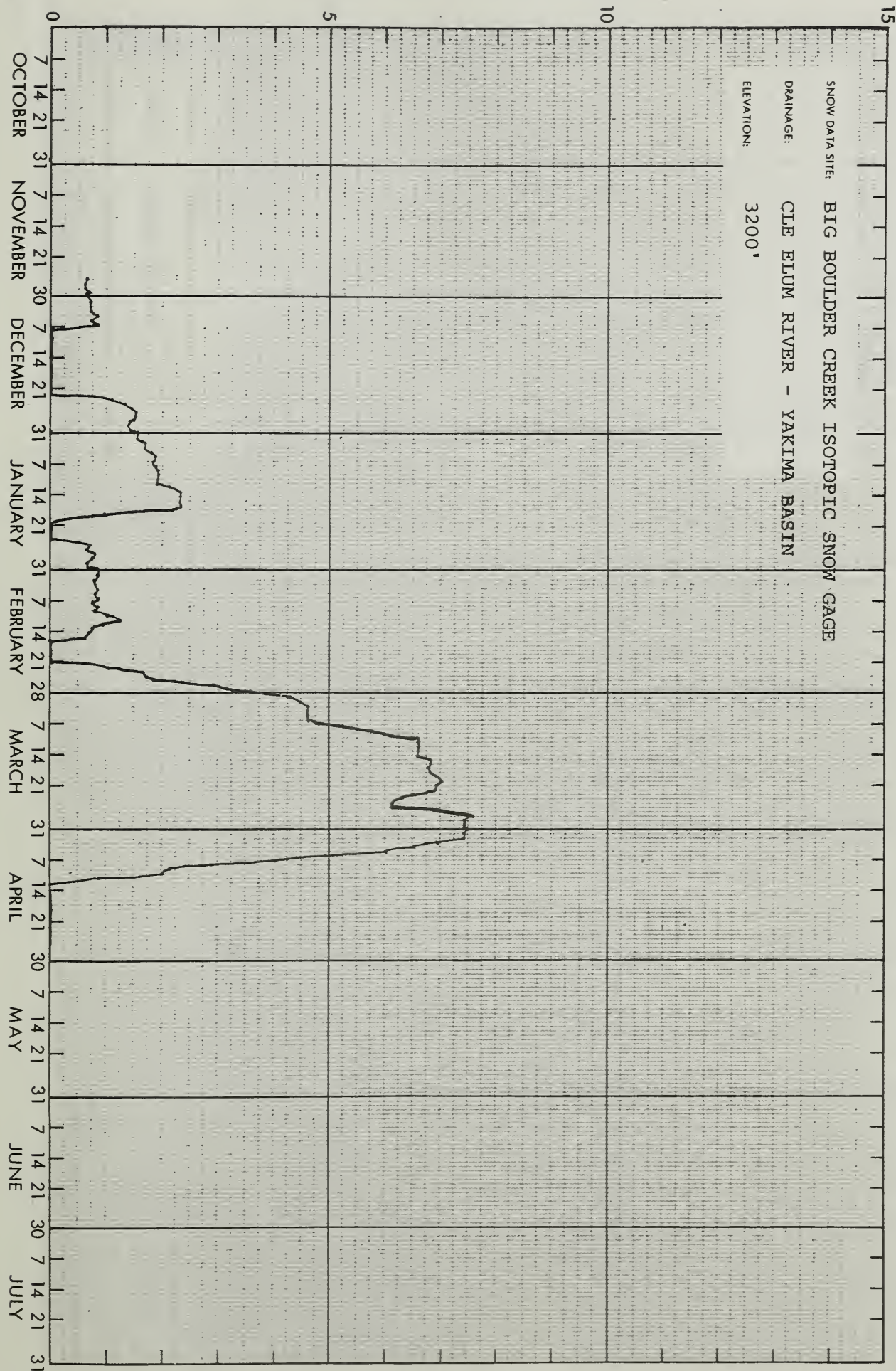
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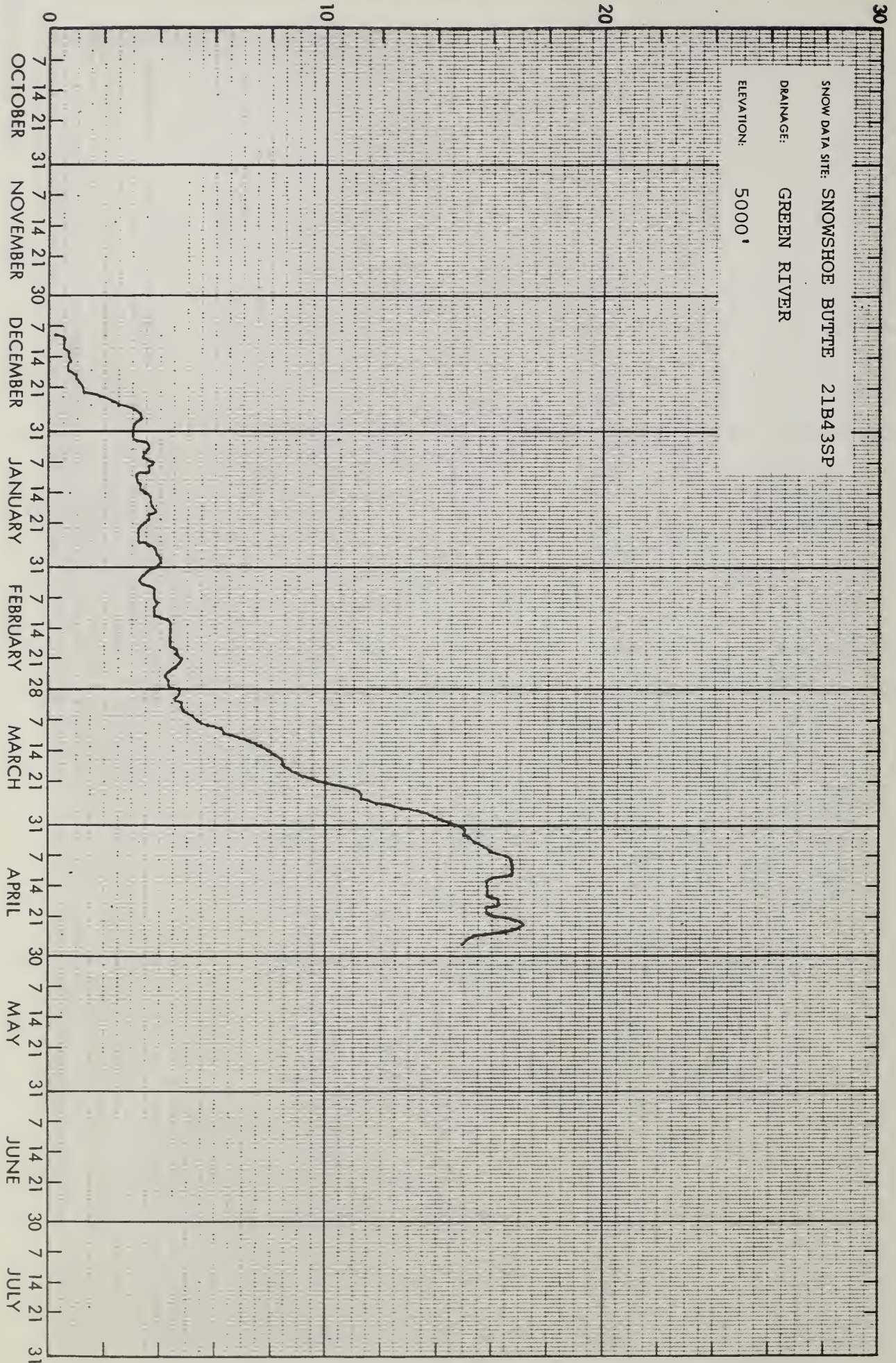
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## INCHES OF WATER IN SNOWPACK





# INCHES OF WATER IN SNOWPACK



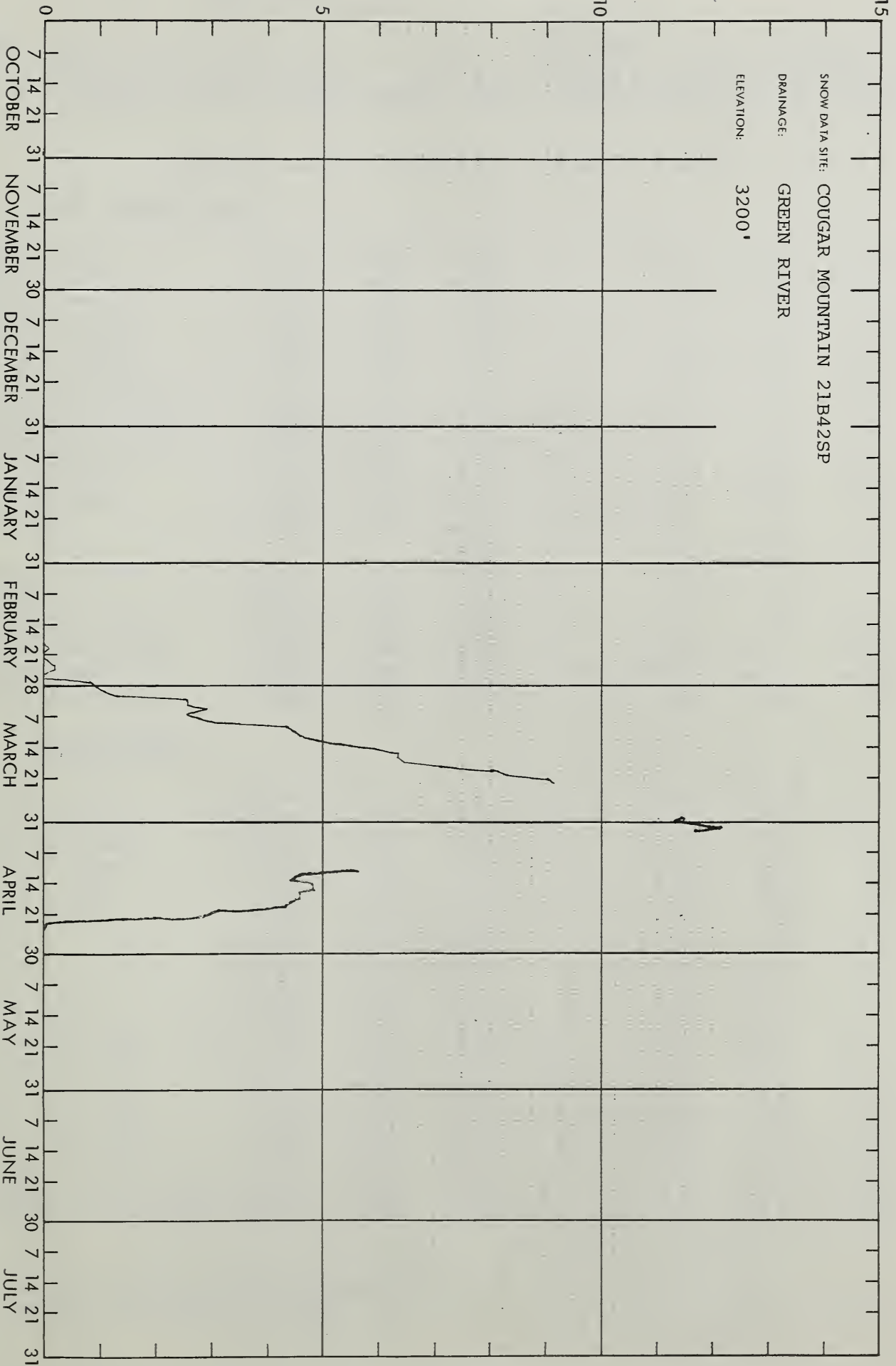
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INCHES OF WATER IN SNOWPACK

SNOW DATA SITE: COUGAR MOUNTAIN 21B42SP

DRAINAGE: GREEN RIVER

ELEVATION: 3200'







## SNOW DATA TO MAY 1, 1977 - APPENDIX 1

SNOW			THIS YEAR			PAST RECORD	
DRAINAGE BASIN and/or SNOW COURSE			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average †

## U P P E R C O L U M B I A D R A I N A G E

PEND OREILLE RIVER

Baree Creek	15B11	5500	4/28	39	18.6	56.2	49.6
Baree Midway	15B16	4600	4/28	30	11.7	37.1	35.1
Baree Trail	15B15	3800	4/28	0	0.0	0.3	1.2
Benton Meadow	16A02	2344	4/27	0	0.0	0.0	0.0
Benton Spring	16A03	4900	4/27	0	0.0	14.5	15.7
Boyer Mountain	17A02	5250	4/28	5.4	2.1	22.2	26.6
Brush Creek Timber	14A13	5000	4/28	0	0.0	8.1	8.2
Bunchgrass Meadow	17A01	5000	4/27	18	6.5	27.5	30.4
Heart Lake Trail	14C10	4800	4/28	10	3.3	20.9	19.0
Hoodoo Basin	15C10	6000	4/28	48	20.6	64.8	55.2
Hoodoo Creek	15C01	5900	4/28	42	18.4	56.4	52.2
Lookout	15B02	5250	4/14	42	15.3	37.5	-
			4/28	23	8.3	38.2	37.7
Mosquito Ridge	16A04A	5100	4/28	12	4.3	-	-
Nelson	19-Can	3050	4/28	4	1.5	7.5	7.7 *
Schweitzer Bowl	16A06	4500	4/29	0	0.0	-	26.6
Schweitzer Ridge	16A05	6100	4/29	31	14.5	-	50.6
Smith Creek	16A01	4800	4/28	37	15.2	43.2	47.9
Winchester Creek	17A03	2970	4/28	0	0.0	0.0	1.6

KETTLE RIVER

Barnes Creek	90-Can	5300	4/28	37	14.0	25.3	21.7*
Big White Mtn.	154-Can	5500	4/28	28	10.3	26.7	22.8*
Bluejoint Mtn.	244-Can	7500	4/28	30	11.3	-	43.1*
Boulder Road	18A02	1450	4/29	0	0.0	0.0	0.0
Butte Creek	18A03	4070	4/29	0	0.0	7.9	5.9
Cabin Creek	18A08	3170	4/29	0	0.0	2.5	1.5
Carmi	126-Can	4100	4/28	0	0.0	5.5	2.2*
Farron # 1	17-Can	4000	4/29	4	1.2	12.7	8.8*
Farron # 2	243-Can	4000	5/2	3	0.9	12.3	12.5*
Goat Creek	18A04	3595	4/29	0	0.0	0.0	0.0
Graystoke Lake	5-Can	5950	4/28	22	10.0	20.5	26.4*
Monashee Pass	48A-Can	4500	4/28	22	8.0	16.2	13.5*
Old Glory Mtn.	42-Can	7000	4/30	15	5.5	33.6	31.9*
Snow Caps Creek	18A05	2150	4/29	0	0.0	0.0	0.0
Snow Caps Trail	18A06	2720	4/29	0	0.0	0.0	0.0
Summit G. S.	18A07	4600	4/29	0	0.0	6.6	6.0
Trapping Creek Lower	166-Can	3050	4/28	0	0.0	0.0	0.0*
Trapping Creek Upper	165-Can	4450	4/28	0	0.0	10.0	7.2*

# Average based on 1958-72 average

\* Average for years of record



## SNOW DATA TO MAY 1, 1977 - APPENDIX 2

## SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

SPOKANE RIVER

Above Burke	15B08	4100	4/28	13	4.7	25.9	-
Copper Ridge	16B02	4800	4/25	0	0.0	28.5	27.3
Forty-nine Meadows	15B03	5000	4/27	15	4.0	27.4	30.3
Fourth of July Summit	16B03	3100	4/28	0	0.0	3.1	-
Granite Peak	15B13A	6000	4/27	47	15.5	44.0	48.3
Kellogg Peak	16B05A	5560	4/28	0	0.0	-	-
Lookout	15B02	5250	4/14	42	15.3	37.5	-
			4/28	23	8.3	38.2	37.7
Lost Lake	15B14A	6000	4/27	52	19.3	59.2	62.0
Lower Sands Creek	16B01	3400	4/25	20	7.3	19.2	16.0
Medicine Ridge	15B04A	6150	4/27	47	16.2	46.8	51.5
Mosquito Ridge	16A04A	5110	4/28	12	4.3	-	-
Roland Summit	15B05A	5200	4/28	0	0.0	-	-
Sunset	15B09A	5600	4/28	18	6.5	-	-

OKANOGAN RIVER

Aberdeen Lake	6A-Can	4300	5/1	0	0.0	2.6	1.9*
Blackwall Mountain	100-Can	6250	4/28	41	15.4	50.8	39.7*
Bouleau Creek	31-Can	5000	Not Measured		-	-	8.7*
Bouleau Lake	234-Can	4580	4/30	17	5.7	17.2	16.3*
Brenda Mine	193-Can	4800	4/29	0	0.0	12.2	11.9*
Brookmere	27-Can	3200	4/25	5	1.2	3.9	6.0*
Carrs Landing Upper	168-Can	3200	5/1	0	0.0	0.0	0.0*
Enderby	130-Can	6250	4/27	77	29.9	46.1	44.4*
Esperon Creek Lower	164-Can	4400	4/29	0	0.0	10.5	12.1*
Esperon Creek Middle	163-Can	4700	4/29	0	0.0	14.5	15.8*
Esperon Creek Upper	162-Can	5400	4/29	16	4.7	19.1	22.6*
Freezeout Meadows New	20A38	5000	4/25	36	14.3	43.9	31.0
Graystoke Lake	5-Can	5950	4/28	22	10.0	20.5	26.4*
Hamilton Hill	107-Can	4900	4/28	16	4.6	17.9	13.7*
Harts Pass	20A05A	6500	4/25	53	21.8	65.9	50.7
Isintok Lake	152-Can	5510	5/1	0	0.0	8.2	8.1*
Lost Horse Mountain	105-Can	6300	4/29	14	3.8	12.2	11.3*
Loup Loup	19A07	4650	4/25	0	0.0	1.8	-
McCulloch	4-Can	4200	4/28	0	0.0	3.2	3.0*
Missezula Mountain	106-Can	5100	4/29	0	0.0	9.1	5.8*
Mission Creek	5A-Can	6000	4/28	39	14.7	25.9	22.3*
Monashee Pass	48A-Can	4500	4/28	22	8.0	16.2	13.5*
Mount Kobau	156-Can	5950	4/29	6	2.1	11.4	14.9*
Mutton Creek No. 1	19A01	5700	4/27	0	0.0	6.5	10.9
Mutton Creek No. 2	19A04	6000	4/27	0	0.0	9.6	15.5
Mutton Creek No. 2SP	19A11SP	6000	4/27	-	0.0	8.6	-

# Average based on 1958-72 average

\* Average for years of record

## SNOW DATA TO MAY 1, 1977 - APPENDIX 3

## SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average <sup>#</sup>

OKANOGAN RIVER (Cont.)

New Copper Mountain	46A-Can	4300	4/27	0	0.0	0.0	2.1*
New Penticton Res.#2	183-Can	5225	4/29	5	1.4	9.2	11.5*
Nickel Plate Mtn.	47-Can	6200	4/30	9	2.6	10.6	8.3*
Oyama Lake	203-Can	4400	5/3	0	0.0	2.1	4.6*
Postill Lake	55-Can	4500	4/29	8	2.7	8.0	7.1*
Quartette Lake	34-Can	4000	4/27	14	4.1	19.1	13.5*
Rusty Creek	19A03	4000	4/27	0	0.0	0.0	0.6
Salmon Meadows	19A02	4500	4/27	0	0.0	1.7	5.4
Silver Star Mountain	99-Can	6050	4/30	37	14.7	37.2	29.1*
Summerland Reservoir	3A-Can	4200	4/30	0	0.0	8.1	7.6*
Touts Coulee	19A06	2845	4/25	0	0.0	-	-
Trout Creek	3-Can	4700	4/28	0	0.0	8.0	5.5*
Vaseux Creek	233-Can	4600	4/29	0	0.0	4.0	3.3*
White Rocks Mountain	70-Can	6000	4/28	18	6.9	25.0	32.0*

METHOW RIVER

Harts Pass	20A05A	6500	4/25	53	21.8	65.9	50.7
Loup Loup	19A07	4650	4/25	0	0.0	1.8	-
Mutton Creek No. 1	19A01	5700	4/27	0	0.0	6.5	10.9
Mutton Creek No. 2	19A04	6000	4/27	0	0.0	9.6	15.6
Mutton Creek No. 2 SP	19A11	6000	4/27	-	0.0	8.6	-
Rusty Creek	19A03	4000	4/27	0	0.0	0.0	0.6
Salmon Meadows	19A02	4500	4/27	0	0.0	1.7	5.4

CHELAN LAKE BASIN

Park Creek Ridge	20A12A	4600	5/3	-	5.8	-	-
Rainy Pass	20A09	4780	4/25	54	21.8	60.2	44.3

ENTIAT RIVER

Blue Creek G. S.	20B28a	5425	4/25	36	11.9	59.2	New
Entiat Meadows +	20A33a	4540	4/25	30	9.9	66.7	41.0
Entiat River Trail +	20A34a	3325	4/25	0	0.0	22.0	9.7
Four Mile Ridge +	20B27a	6800	4/25	12	4.0	52.2	-
Fox Camp +	20A36a	6510	4/25	59	19.5	79.0	63.5
Pope Ridge	20B20	3540	4/26	0	0.0	11.0	8.2
Pugh Ridge +	20A32a	6725	4/25	34	11.2	51.2	38.7
Shady Pass	20A37	6200	4/27	6.6	2.2	41.7	-
Snow Brushy +	20A35a	3910	4/25	21	6.9	23.2	30.8
Tommy Creek +	20B21a	4900	4/25	0	0.0	30.1	22.5

# Average based on 1958-72 average

\* Average for years of record

+ Snow water equivalent estimated from aerial stadia observation.

## SNOW DATA TO MAY 1, 1977 - APPENDIX 4

## SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

WENATCHEE RIVER

Berne-Mill Creek	21B23	2925	4/28	11	6.0	29.0	21.1
Berne-Mill Creek New	21B41SP	3240	4/28	0	0.0	20.0	17.7
Blewett Pass No. 2	20B02	4270	4/12	4.1	2.2	17.4	13.0
			4/27	0	0.0	16.2	9.5
Chiwaukum G. S.	20B16	1810	4/28	0	0.0	0.0	1.8
Fish Lake	21B04	3371	4/26	5	2.0	40.8	26.7
Lake Wenatchee	20B05	1970	4/28	0	0.0	8.0	1.6
Leavenworth R. S.	20B17	1127	5/1	0	0.0	0.0	0.0
Merritt	20B18	2140	4/28	0	0.0	11.2	3.8
Stevens Pass	21B01	4070	4/14	65	25.6	59.3	55.2
			4/28	49	22.9	63.3	55.8
Stevens Pass Sand Shed	21B45	3700	4/13	32	12.2	42.9	-
			4/28	14	7.6	42.3	-

SQUILCHUCK CREEK

Beehive Springs	20B03	4400	4/28	0	0.0	0.0	1.7
Scout-A-Vista	20B04	3400	4/28	0	0.0	0.0	0.4

STEMILT CREEK

Jump-Off	20B08	4450	4/28	0	0.0	2.0	2.8
Stemilt Slide	20B06	5000	4/28	0	0.0	8.0	7.1
Upper Wheeler	20B07	4400	4/28	0	0.0	0.0	1.0

COLOCKUM CREEK

Colockum Creek Upper	20B22	5300	4/28	0	0.0	4.5	-
Colockum Creek Lower	20B23	4300	4/28	0	0.0	0.0	-
Trough # 2	20B25SP	5310	4/28	0	0.0	4.3	-

YAKIMA RIVER

Big Boulder Creek	21B09	3200	4/26	0	0.0	17.0	7.4
Blewett Pass No. 2	20B02	4270	4/12	4.1	2.2	17.4	13.0
			4/27	0	0.0	16.2	9.5
Bumping Lake	21C08	3450	4/15	0	0.0	15.2	13.4
			5/2	0	0.0	11.4	9.4
Bumping Lake New	21C36	3400	4/15	0	0.0	21.4	-
			5/2	0	0.0	18.5	15.0
Cayuse Pass	21C06	5300	4/26	88	43.4	108.6	-
Corral Pass	21B13	6000	4/26	39	15.6	53.9	-
Fish Lake	21B04	3371	4/26	5	2.0	40.8	26.7

# Average based on 1958-72 average



## SNOW DATA TO MAY 1, 1977 - APPENDIX 5

## SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average <sup>†</sup> <sub>#</sub>

YAKIMA RIVER (Cont.)

Joe Lake +	41B46a	4624	4/26	93	40.0	94.6	-
Lake Cle Elum	21B14M	2200	4/15	0	0.0	6.3	-
			4/29	0	0.0	0.0	0.0
Lemah Creek +	21B47a	3327	4/26	36	14.0	35.2	-
Morse Lake	21C17	5400	5/1	41	18.0	59.5	65.1
Olallie Meadows	21B02	3625	4/14	51	20.2	55.6	48.4
			4/25	35	15.9	57.1	48.6
Stampede Pass SP	21B10	3860	4/15	-	12.0	42.6	43.4
			5/1	-	6.9	36.6	43.4
Tunnel Avenue	21B08	2450	4/15	0	0.0	29.6	20.1
			4/29	0	0.0	24.6	16.0
Van Epps Pass +	20B26a	5925	4/26	56	21.8	63.0	-
Waptus Lake +	21B49a	3024	4/26	33	12.9	33.3	-
White Pass (E. Side)	21C28	4500	4/15	17	6.3	28.9	26.0
			5/1	0	0.0	29.7	25.9

LOWER COLUMBIA DRAINAGEASOTIN CREEK

Spruce Springs	17C04	5700	4/25	4.4	1.8	29.5	25.8
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MILL CREEK

Tollgate	18D3M	5070	4/28	0	0.0	33.6	18.9
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WHITE SALMON RIVER

Cultus Creek	21C12	4000	4/25	42	18.3	53.6	48.9
Surprise Lakes	21C13A	4250	4/25	29	13.2	56.3	52.9

WIND RIVER

Old Man Pass	21D19	3100	4/25	0	0.0	22.6	12.6
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LEWIS RIVER

Blue Lake +	21C22a	4800	4/25	85	39.1	106.5	92.4
Bob's Trail	21C21	2200	4/25	0	0.0	18.7	7.8
Clamity Ridge +	22D01a	2500	4/25	0	0.0	8.0	1.3
Council Pass +	21C18a	4200	4/25	30	13.5	54.0	38.8
Cultus Creek	21C12	4000	4/25	42	18.3	53.6	48.9
Divide Meadow +	21C29a	5600	4/25	48	21.6	77.4	65.5

# Average based on 1958-72 average

+ Snow water equivalent estimated from aerial stadia observation

## SNOW DATA TO MAY 1, 1977 - APPENDIX 6

## SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average <sup>†</sup> #

LEWIS RIVER (Cont.)

Grand Meadow	21C25	3500	4/25	0	0.0	26.7	22.4
Lone Pine Shelter	21C26	3800	4/25	38	15.9	56.9	46.3
Marble Mountain +	22C05a	3200	4/25	10	4.9	42.2	33.2
New Muddy River	22C06	2000	4/25	0	0.0	2.0	0.8
Old Man Pass	21D19	3100	4/25	0	0.0	22.6	12.6
Plains of Abraham +	22C01a	4400	4/25	70	32.9	73.6	76.9
Smith Creek Road	22C04	2100	4/25	0	0.0	4.2	5.3
Spencer Meadow +	21C20a	3400	4/25	12	5.4	27.3	16.1
Surprise Lakes	21C13A	4250	4/25	29	13.2	56.3	52.9
Table Mountain +	21C24a	4200	4/25	36	16.2	59.4	40.3
Timbered Peak +	21D18a	3000	4/25	4	1.8	23.4	9.9

COWLITZ RIVER

Cayuse Pass	21C06	5300	4/26	88	43.4	108.6	-
Plains of Abraham +	22C01a	4400	4/25	70	32.9	73.6	76.9
White Pass (E. Side)	21C28	4500	4/15	17	6.3	28.9	26.0
			5/1	0	0.0	29.7	25.9

WHITE RIVER

Cayuse Pass	21C06	5300	4/26	88	43.4	108.6	-
Corral Pass	21B13	6000	4/26	39	15.6	53.9	-
Morse Lake	21C17	5400	4/29	41	18.0	59.5	65.1

GREEN RIVER

Snowshoe Butte SP	21B43SP	5000	4/27	48	21.1	68.9	-
Stampede Pass SP	21B10	3860	4/15	-	12.0	42.6	43.4
			5/1	-	6.9	36.6	43.4

SNOQUALMIE RIVER

Olallie Meadows	21B02	3625	4/14	51	20.2	55.6	48.4
			4/25	35	15.9	57.1	48.6

SKYKOMISH RIVER

Stevens Pass	21B01	4070	4/14	65	25.6	59.3	55.2
			4/28	49	22.9	63.3	55.8
Stevens Pass Sand Shed	21B45	3700	4/13	32	12.2	42.9	-
			4/28	14	7.6	42.3	-

# Average based on 1958-72 average

+ Snow water equivalent estimated from aerial stadia observation.

## SNOW DATA TO MAY 1, 1977 - APPENDIX 7

## SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

SKAGIT RIVER

Beaver Creek Trail	21A04	2200	4/25	0	0.0	16.7	4.8
Beaver Pass	21A01	3680	4/25	16	6.6	42.0	34.0
Brown Top	21A28a	6000	4/25	74	31.0	96.6	-
Devils Park	20A04A	5900	4/25	52	22.1	69.0	49.5
Freezeout Cr. Trail	20A01	3500	4/25	0.9	0.4	14.9	8.2
Freezeout Meadows New	20A38	5000	4/25	36	14.3	43.9	31.0
Granite Creek	21A29	3500	4/25	6.4	2.4	24.6	-
Harts Pass	20A05A	6500	4/25	53	21.8	65.9	50.7
Klesilkwa	35B-Can	3700	4/27	0	0.0	-	12.8*
Meadow Cabins	20A08	1900	4/25	0	0.0	4.2	1.3
New Hozomeen Lake	21A30	2800	4/25	0	0.0	13.7	-
New Tashme	26A-Can	2500	4/29	0	0.0	4.0	5.7*
Quartette Lake	34-Can	4000	4/27	14	4.1	19.1	13.5*
Rainy Pass	20A09	4780	4/25	54	21.8	60.2	44.3
Thunder Basin	20A07	4200	4/25	28	10.5	28.5	25.5

BAKER RIVER

Baker Pass +	21A27a	4900	4/27	108	45.4	119.0	-
Dock Butte	21A11A	3800	4/26	82	35.0	101.6	77.4
Easy Pass	21A07A	5200	4/27	100	42.2	123.0	93.3
Jasper Pass	21A06A	5400	4/27	114	48.9	126.8	102.7
Komo Kulshan	21A17	800	4/26	0	0.0	0.0	0.7
Marten Lake	21A09A	3600	4/27	104	43.7	114.0	83.8
Mount Blum +	21A18a	5800	4/27	96	40.3	94.6	-
Panorama New	21A26	4300	4/15	100	36.3	85.1	-
			5/1	73	35.2	95.7	-
Rocky Creek	21A12A	2100	4/26	20	8.8	49.0	22.6
Schreibers Meadow	21A10A	3400	4/26	79	32.4	86.2	67.5
S. F. Thunder Creek	21A14A	2200	4/26	0	0.0	8.0	1.1
Sulphur Creek	21A13	1600	4/26	0	0.0	20.9	6.4
Three Mile Creek	21A15	1600	4/26	0	0.0	0.0	0.0
Watson Lakes	21A08A	4500	4/26	87	35.7	92.0	76.9

NOOKSACK RIVER

Panorama New	21A26	4300	4/15	100	36.3	85.1	-
			5/1	73	35.2	95.7	-

# Average based on 1958-72 average

\* Average for years of record

+ Snow water equivalent estimated from aerial stadia observation.



## SNOW DATA TO MAY 1, 1977 - APPENDIX 8

**SNOW**

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average <sup>†</sup> <sub>#</sub>

DUNGENESS RIVER

Deer Park	23B04	5200	4/28	16	7.8	-	24.2
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MORSE CREEK

Cox Valley	23B14	4500	4/30	34	16.5	57.9	-
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ELWHA RIVER

Hurricane	23B03	4500	4/27	24	8.5	34.0	26.9
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# Average based on 1958-72 average.

# IMPORTANT NOTICE

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